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Gleanings in Bee Culture



Apple Trees in Bloom.—A. I. Root's Orchard.

Published by The A. I. Root Co., Medina, Ohio, U. S. A.

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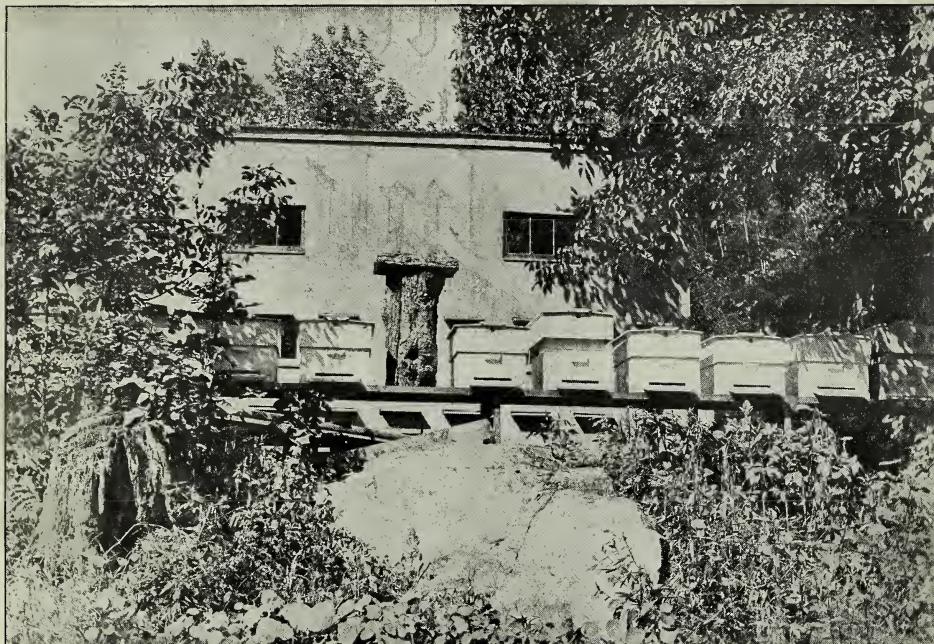
Vol. XXXVI

April 1, 1908

No. 7



THE OBSERVER APIARIAN LABORATORY



The Largest and Best-equipped Experimental and Scientific Apiary in the United States is located at Stamford, Ct. It is under the management and personal work of Edward F. Bigelow, A.M., Ph.D., "The Nature-study Man," well-known to all readers of **GLEANINGS IN BEE CULTURE**. This laboratory is well-equipped with experimental cages, apparatus, and appliances. It contains eight educational hives in four different designs (made by The A. I. Root Company). There are thirty-eight colonies at present under careful experiment and observation. In direct connection with the laboratory is a photograph gallery fitted with cameras and high-grade lenses, including a 6 1-2 x 8 1-2 photo-micrographic camera fitted with acetylene and oxy-hydrogen light, far beyond the power and scope of the ordinary laboratory. A sample of the work of this laboratory was "The Story of Honey-comb," published in **GLEANINGS IN BEE CULTURE** for August 1, 1907. To that article Editor Root had the following introduction:

"The following article by Professor Edward F. Bigelow, the nature-study man, lecturer, and one of the editors of *St. Nicholas Magazine* on the subject of honey-comb, its construction and development, is one of the best if not THE best that was ever written. The photographs are superb, and instructive as well as interesting. The article as a whole will be incorporated in the next edition of our A B C of Bee Culture, now in process of revision, and, later on, made the subject of a special booklet."

Other articles equally or more instructive and entertaining are now in preparation. Much of the work of this laboratory, in the future, will be published in

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FANCY.—All sections well filled, combs straight, firmly attached to all four sides, the comb unsoiled by travel-stain or otherwise; all the cells sealed except an occasional one, or the outside surface of the wood well scraped of propolis.

No. 1.—All sections well filled except the row of cells next to the wood; combs straight; one-eighth part of comb surface soiled, or the entire surface slightly soiled; the outside surface of the wood well scraped of propolis.

No. 2.—All sections well filled except the row of cells next to the wood; combs comparatively even; one-eighth part of comb surface soiled, or the entire surface slightly soiled.

No. 3.—Must weigh at least half as much as a full-weight section.

In addition to this the honey is to be classified according to color, using the terms white, amber, and dark; that is, there will be "Fancy White," "No. 1 Dark," etc.

NEW YORK.—Market very quiet on comb honey as well as extracted. Our comb honey is fairly well cleaned up, but there is still considerable left, and unless the demand improves most of the lower grades, in all probability, will have to be carried over. While there is a fair demand for extracted, it does not compare favorably with former years, and it is almost impossible to sell large quantities. Prices remain about the same. Beeswax somewhat firmer and in good demand at from 29 to 31 according to quality.

HILDRETH & SEGELKEN,
March 26. 265 Greenwich St., New York.

ST. LOUIS.—Since our last there has been no improvement in the market for honey. Comb honey is especially dull. The stocks on hand, however, are small. We quote: Fancy white comb honey, 15 to 16; No. 1, 13 to 14; amber, 13 to 14; broken and defective, less; extracted, in cans, white, nominal at 8½ to 9; amber, 7 to 8; in barrels, 6½ to 7; granulated extracted sells at ½ to 1 cent per lb. less. Beeswax is firm at 28 for prime; all impure and inferior, less

R. HARTMANN PRODUCE Co.,
March 20. St. Louis, Mo.

ZANESVILLE.—The honey market remains quiet, although if any thing there is a slight improvement, and also some stiffening in prices. No. 1 to fancy white comb brings wholesale from 18 to 21, according to quality and source. There is some demand for best extracted in glass packages for the retail trade. Beeswax is in light demand; would pay 30 cts. f. o. b. here in exchange for bee-supplies.

EDMUND W. PEIRCE,
March 18. 136 W. Main St., Zanesville, O.

INDIANAPOLIS.—Very little honey is now being offered by producers; and while our market is fairly well stocked the demand is slow, and indications are for a decline in prices. Jobbers are offering the following prices, delivered here: No. 1 and fancy comb, 16 to 17; extracted white clover, 9 to 10; amber in barrels, slow at 6 to 6½. Beeswax, 28 cents cash, or 30 in exchange for merchandise.

W. S. POUDER,
March 18. Indianapolis, Ind.

KANSAS CITY.—The demand for comb and extracted is light, and receipts good. We quote: Fancy white comb, 24 sections, \$3.10 per case; No. 1 white comb, 24 sections, \$3.00 per case; No. 2 white comb, 24 sections, \$2.75 per case; white extracted, per lb., 8. Beeswax, 25.

C. C. CLEMONS & Co.,
March 20. Kansas City, Mo.

CHICAGO.—There is very little demand for honey of any kind, and the supply is quite large; hence there is very little opportunity to make sales under the e conditions; but the general tendency in prices now is downward. Beeswax is steady at 28 to 30.

R. A. BURNETT & Co.,
March 19. Chicago, Ill.

SAN FRANCISCO.—Honey remains quite firm at prices that have prevailed for some time. There is none of much consequence coming in at present, and with a limited demand the market shows no great activity. Water-white comb, 16 to 17; white, 15; water-white, extracted, 8 to 8½; light amber, extracted, 7 to 7½; dark amber and candied 5½ to 5¾.

Pacific Rural Press, March 14.

ST. PAUL.—Receipts are very light; demand moderate, and prices steady. The prices below represent those obtained for shipment in small lots. Fancy white clover, per lb., 18; fancy California, 24 combs to the case, \$4.00; strained, in 60-lb. cans, per lb., 10 cts.

W. H. PATTON, Sec. Board of Trade,
March 23. St. Paul, Minn.

BUFFALO.—The demand here for honey is very slow—receipts more liberal lately. We quote fancy white comb, 16 to 17; No. 1 white comb, 15 to 16; No. 2 white comb, 12 to 13; buckwheat, comb, 11 to 12; white extracted, 8 to 10; dark extracted, 7 to 8. Beeswax, 30. March 27. W. C. TOWNSEND, Buffalo, N. Y.

LIVERPOOL.—Honey, steady, with Chilian, at 4 to 6½; Peruvian, 3½ to 5; California, 7½ to 10; Jamaican, 4½ to 4½; Haitian, 5 to 5½. Beeswax from Africa, 29 to 30; Jamaican, 34 to 35; American, 30 to 33; West Indian, 29 to 32; Chilian, 30 to 36.

TAYLOR & CO.,
March 14. 7 Tithebarn St., Liverpool.

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market.

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BISCUIT COMPANY
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WE WILL BUY AND SELL
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Denver, Col., Feb. 28, 1908.

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Devoted to Bees, Honey, and Home Interests.

Published by
THE A. I. ROOT CO., Medina, Ohio

J. T. CALVERT, Business Manager

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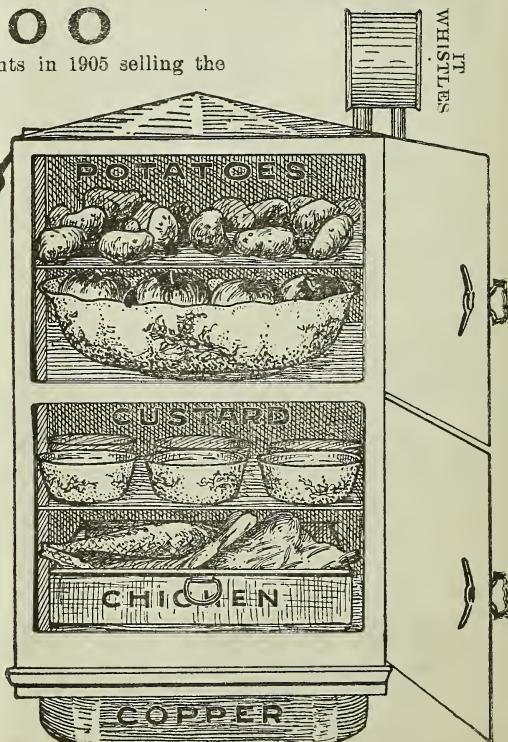
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READ WHAT EXPERTS SAY OF IT

The Christmas mail brought me what is probably as useful and beautiful a Christmas present as I ever received—a morocco-bound copy of the new edition of the A B C and X Y Z of Bee Culture. Bee books and journals have come to my desk of which it seemed as though the least said the better. Not so with this book. On the contrary, it seems as though words were lacking to do it justice. There are many other bee-books, each filling its niche, but, in all the world, there is nothing so comprehensive as the A B C and X Y Z of Bee Culture. There is no point in the wide domain of apiculture that is not touched upon in this volume, and the information is the very latest and most authentic, well written and well illustrated. The amateur and the expert are both served equally well.—W. Z. HUTCHINSON, editor and proprietor of the *Bee-keepers' Review*, and author of Advanced Bee Culture.

No bee-keeper's library can be at all complete without a copy of this magnificent aparian work. It has reached a sale of over 100,000 copies already, being the most largely sold book on bees in the world. Better send to us for a copy to read during the long winter evenings.—*American Bee Journal*.

This work of 536 pages is, as its name implies, a complete cyclopædia of every thing pertaining to bees and bee-keeping. It was originally compiled by A. I. Root, who in the 1877 preface, after stating his indebtedness to Langstroth, Quinby, and others, says that, "A great part of this A B C book is really the work of the people, and the task that devolves on me is to collect, condense, verify, and utilize what has been scattered through thousands of letters for years past." Since the first copy of this work appeared, now thirty-one years ago, it has undergone many revisions, and has had many additions, both of letterpress and illustrations, while the rapid advancement in bee culture has made it necessary in many cases to remove whole articles and rewrite them entirely. The revision has been ably carried out by E. R. Root, the present editor of GLEANINGS, who has had the assistance of a number of well-known and able men. In the preface the names of the writers of the different articles are given. For instance, we find Dr. C. C. Miller writes on honey-comb and out-apisaries; Dr. E. F. Phillips on the eye, parthenogenesis, and scent of bees; E. R. and H. H. Root on wax and wintering, both of these having carried out a number of experiments on these subjects. There are also articles by W. K. Morrison and Mrs. Comstock. It seems almost superfluous to say anything about a book of which already 100,000 copies have been sold; the simple fact speaks for itself that it fills a want, and is an attestation of its worth. Among the articles that have been revised we find the new methods of queen-rearing described, so that the practical bee-keeper will have the latest and best ideas on the subject before him for reference. The new methods of wax-production are treated in an exhaustive manner, and as this subject is of more importance than formerly, greater space has been devoted to it. We have nothing but good words for this work, and recommend our readers to get a copy of the 1908 edition. The work is profusely illustrated and beautifully printed, and is a credit to the publishers.—By T. W. COWAN, Esq., editor of the *British Bee Journal*. Mr. Cowan is the author of two first-class books on bees and bee-keeping, "The Bee-keeper's Guide," and "The Honey-bee."

THE A. I. ROOT CO.
MEDINA, OHIO

Gleanings in Bee Culture

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BICYCLES TO THE FORE.

If you are interested in beautiful printed matter, we feel sure you will be delighted with the new catalog issued by the Meade Cycle Co., of Chicago. It is, undoubtedly, the handsomest bicycle catalog ever printed, and can not, of course be scattered broadcast, owing to the cost of publication. However, we are happy to announce that, by special arrangement, every reader of this journal who is interested in bicycles may obtain a free copy by simply sending a postal card to the Meade Cycle Co., Chicago, stating that you are a regular reader of this paper. This concern, with its foreign branches, sells bicycles direct to the rider by mail, and has thousands of customers in all parts of the world. A recent inspection of their vast Chicago storage warehouse found them well prepared for the spring and summer rush of orders, with over ten thousand bicycles piled tier on tier on tier, crated and ready for immediate shipment.

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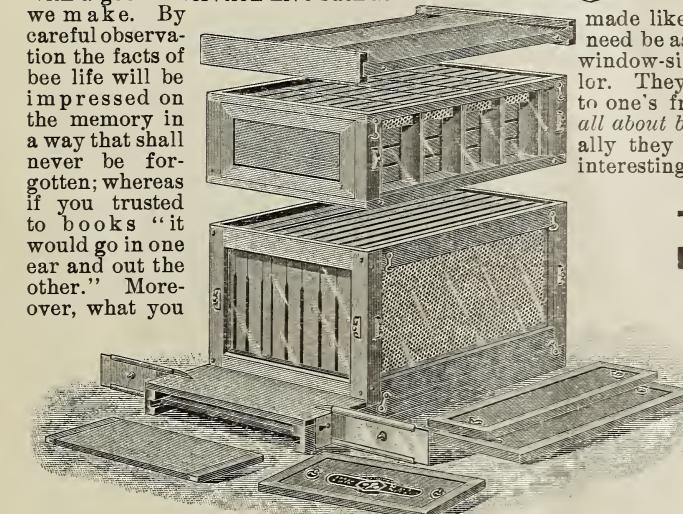
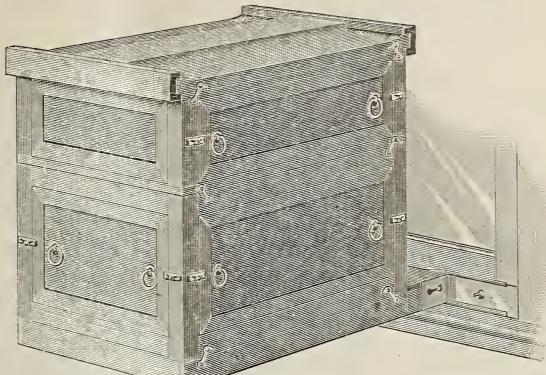
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Root Observation Hives for Nature Study.

At the present time the general tendency is to go to nature for our facts; and students of any phase of natural science are expected to rely on personal observation for the larger part of their knowledge.

For a thorough and intimate acquaintance with the facts of insect life in general or of bee life in particular there is nothing to be compared with a good observation hive such as we make. By careful observation the facts of bee life will be impressed on the memory in a way that shall never be forgotten; whereas if you trusted to books "it would go in one ear and out the other." Moreover, what you



read in books is not always so. We make up these hives in a number of ways to suit various ideas and different-sized purses. In the end they all amount to the same thing—a considerable addition to our stock of real knowledge.

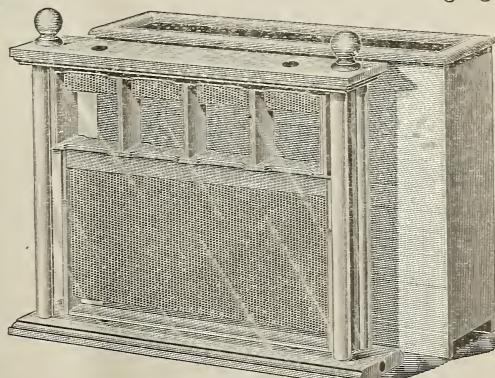
The CONSTRUCTION IS OF THE BEST.

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made like good furniture, and nobody need be ashamed to have a hive on the window-sill of the sitting-room or parlor. They are excellent for showing to one's friends who require to learn *all about bees* in one lesson. Incidentally they help the sale of honey by interesting consumers in honey-bees.

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A GREAT "LITTLE" INDUSTRY.

A very handsome and most practical book has just been issued by the Reliable Incubator and Brooder Co., box 49, Quincy, Ill. Even the most experienced poultry-breeder would find this of interest; and, of course, to the inexperienced it is more valuable, containing as it does a mass of practical up-to-date information, much of which is not set down in poultry-books.

Before investing in any books or appliances for the poultry business we would suggest sending for this book. It contains 136 pages devoted to the following subjects: How to get fertile eggs; how to get bigger hatchies; how to rear heavy fowls; how to get broilers ready for the market in time to get top-notch prices; how to buy a good serviceable incubator, and a number of other practical points, all bearing on the question of dollars and cents. It is beautifully illustrated; and, although it contains so much, it is sent free to all our readers if they will simply say they are subscribers to this journal, or that they saw this statement therein.

SUCCESSFUL INCUBATORS.

One of the "old reliable" firms in the manufacture of incubators is the Des Moines Incubator Co., of Des Moines, Ia. They have been a long while in

the business—long enough to acquire a vast fund of information on the rearing and feeding of poultry raised by artificial means. In the course of their experience they must have taught thousands of successful poultry-keepers the principles of the art.

They have embodied the most of this information (boiled down, it is true) in their regular catalog, which is free to all who apply for it. Beyond this the company have a book which gives a great deal of valuable information relative to various phases of the poultry industry. The title of this book is, "The Proper Care and Feeding of Chicks, Ducks, Geese, and Turkeys." The price is 10 cts. prepaid.

It would be a mistake to think that this book is worth only ten cents. On the contrary, it is well worth fifty cents to any poultryman desirous of increasing his knowledge of poultry culture. We have alluded before to the great liberality of the incubator manufacturers in the matter of literature. They issue books which cost them thousands of dollars to print and publish. These are not mere advertisements, but are really excellent treatises on the subjects with which they deal, and the information is of the most reliable and accurate kind. Moreover, they are very practical.

The best we can do under the circumstances is to advise those of our readers who are interested in poultry culture to write direct to the Des Moines Incubator Co. and see whether these things are so.

Bees For Sale.

My bees have wintered perfectly—clean, dry, and free from dysentery—and I have decided to sell a few colonies. The bees are of the Superior stock, the hives nearly new, in good condition, and well painted. The combs are all-worker—mostly built on wired foundation. Everything is strictly first-class.

For a colony in an eight-frame Langstroth hive the price is \$6.00; in a ten-frame Langstroth, or in a new Heddon hive (two sections) the price is \$7.00; and to each purchaser of one or more colonies the Review will be sent free for 1908.

I am now ready to accept and book orders accompanied by the cash; and when I have received as many

orders as I care to fill, no more will be accepted. The bees will be shipped by express, about the close of fruit-bloom, when the newly gathered honey will furnish the necessary water, and safe arrival will be guaranteed in every respect.

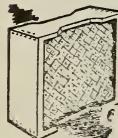
If you wish to stock your apiary with a strain of bees that has no superior, here is a chance to get a breeding-queen, such as the most of dealers ask from \$3.00 to \$5.00 for, already introduced, in a full colony, whereby she can be shipped without injury, early in the season, all at a moderate price.

W. Z. HUTCHINSON, Flint, Mich.

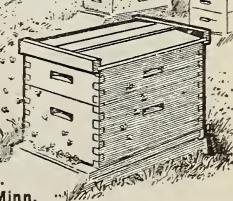
BEE KEEPING

Honey is high—short crop last year. The shortage of the honey crop for 1907 in the United States warrants bee-keepers to increase their colonies. About a half crop was produced, and in California, where the cheap honey comes from, only a quarter of the average crop was produced.

Get Ready Now for More Honey



Let us send you our catalog. We are manufacturers and sell only our own make of bee-supplies. Minneapolis is the largest lumber-distributing point; the Mississippi river furnishes us power, and our organization and labor conditions are the best for economical production. Send us an estimate of your requirements and let us give you prices. We have a large stock of standard bee-supplies on hand.



Dovetailed Hives, Sections, Section-holders, Separators, Brood-frames, Comb Foundation, Smokers, Extractors, Shipping-cases, etc.

MINNESOTA BEE SUPPLY COMPANY, 23 Nicollet Island, Minneapolis, Minn.

Keep your  on this ad.

We intend to keep a full stock of The A. I. Root Co.'s goods on hand this season, as we have in the past. When in need of bee-supplies, write us. Get our catalog at once.

For prompt shipments and good service, we are at your command.

JOHN NEBEL & SON SUPPLY CO., HIGH HILL, MONTGOMERY CO., MISSOURI.

This Coupon worth 25 Cents!

If not now a subscriber and you want one of the most helpful aids to successful bee-culture—a paper that tells how to make your bees pay—you should subscribe for the

AMERICAN - BEE - JOURNAL

A 32-page illustrated 50-cent monthly. It tells all about the best way to manage bees to produce the most honey; with market quotations, etc. A dozen different departments—one for women bee-keeper. . . . Best writers.

It will increase your Honey-money!

If you will send us your name and address with 25 cents (stamps or coin) together with this coupon, we will send you a trial trip of our journal for 12 months. Order now, and let us begin with this month's fine number. Address

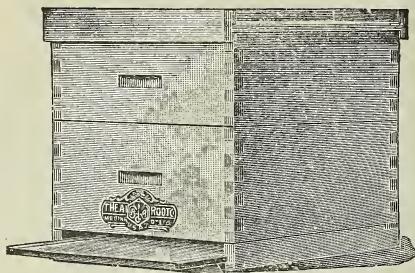
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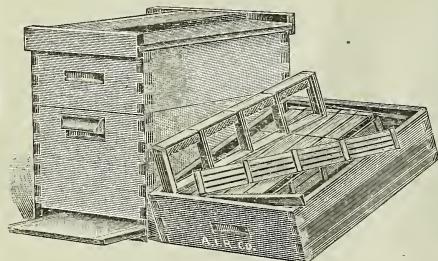
State.....

American Bee Journal, 118 W. Jackson, Chicago, Illinois



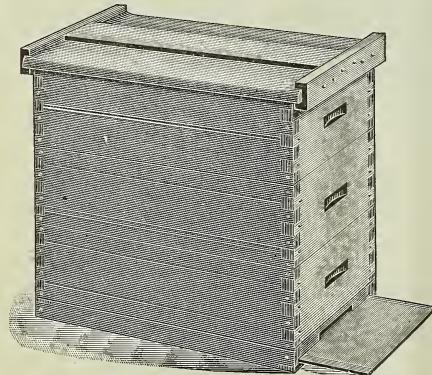
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The Best Comb-honey Hive



1 1/2-story Dov'd Hive for Comb Honey.

The Best All-around Hive



Divisible Brood Chamber Hive.

The Best Hive for Experts

THE A. I. ROOT COMPANY
SYRACUSE,  NEW YORK

APICULTEURS

des pays de langue Francaise.
Nous vous Informons que.

L'Apiculture Nouvelle

Revue mensuelle illustree,
est tiree de:

Gleanings in Bee Culture

augmentee et completee par des collaborateurs
Europeens, reconnus comme Apiculteurs eminents.

L'Abonnement d'un an est envoye franco pour
tous pays de l'Union Postale, contre l'envoi par
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francais de tous les articles de la

A. I. ROOT CO.

est envoye gratuitement sur simple demande,
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Agent General pour l'Europe et les Colonies

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est egalement parue.

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WE are pleased to say that we are able to
offer, in Canada, goods manufactured by
The A. I. Root Co. While we do not offer
every thing listed in their catalog, we have selected
such articles as we believe will best meet
the wants of the Canadian bee-keepers.

The heavy duty and freight charges we have
to pay make it impossible for us to sell in Cana-
da at Root's prices. We have, however, made
prices as low as possible, and in no case do we
charge nearly as much extra as the amount of
freight and duty we ourselves have to pay on
the goods.

We would ask you, when comparing our prices
with those of other dealers, to take into considera-
tion the QUALITY. If you do so we feel
satisfied that you will place your order with us.
The splendid quality of the material sent out
by The A. I. Root Co. has given "Root's Goods"
a world-wide reputation. Remember, "The best
is cheapest."

E. GRAINGER & COMPANY,
Deer Park,
Toronto, Ontario, Canada.

CANADIAN AGENTS FOR
THE A. I. ROOT CO., MEDINA, OHIO, U. S. A.

WE HANDLE the BEST GOODS OBTAINABLE

Lewis Root's Dadant's
 BEE-HIVES and SECTIONS. SMOKERS and EXTRACTORS. COMB FOUNDATION.

If you live west of the Missouri river, send for our FREE 48-page illustrated catalog to-day and save money. We are a co-operative association of bee-keepers, and can supply comb and extracted honey at all times.

The Colorado Honey-Producers' Association

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DENVER, COLORADO



HIGHLAND FARM QUEENS



are the result of years of careful selection and judicious breeding from the best strains of superior long-tongue red-clover Italians in America and Italy—strains that have gained a world-wide reputation for hardiness, gentleness, and superior honey-gathering qualities. Highland Farm queens are bred strictly for business by an expert queen-breeders of 20 years' experience. Highland Farm methods will produce **PERFECTLY DEVELOPED, LONG-LIVED, AND PROLIFIC QUEENS**. If you want *cheap* queens, the woods are full of them. If you want the best that can be produced by the most scientific methods, Highland Farm queens will not disappoint you. Single queen, \$1.00; 6, \$5.00; 12, \$9.00. Safe delivery and satisfaction guaranteed.

Send for circular.

HIGHLAND BEE AND POULTRY FARM, J. E. HAND, Proprietor, BIRMINGHAM, ERIE CO., O.

“Root Quality”

We are MICHIGAN headquarters for “ROOT QUALITY” goods. If you keep bees and live in MICHIGAN, we want to send you our 1908 catalog. We can supply you with Root's goods to your advantage.

M. H. HUNT & SON
 WAYNE CO.

REDFORD, MICH.

M. H. Hunt & Son.

Dear Sirs:—Please find enclosed \$1.15 for which please send me GLEANINGS one year (new or renewal) and, as a premium, a good bee-veil with a silk tulle front, postpaid.

Name _____

Address _____



No matter where you are in the United States, we want your subscription to GLEANINGS. If you renew soon, take advantage of this and have an extra veil to use this summer.

What's the Matter With Hilton?

WHY!

He has got his new goods fresh from The A. I. Root factory, and his 1908 catalog, and wants you to send for one free—40 pages illustrating and describing Root's goods at Root's prices. Send him a list of what goods you want, and let him tell you how much they will cost you.

Cash or supplies for beeswax at all times.

GEORGE E. HILTON
FREMONT, :: :: MICHIGAN

OUR SUPPLY BUSINESS HAS BEEN IN New York City

for 15 years. It has increased each year. We want YOUR order this year, and will quote you attractive prices. Our prices are f. o. b. cars here. We furnish bees in any quantities. Have seven hundred colonies in our own yards. Catalog free.

I. J. STRINGHAM,
Apilaries, Glen Cove, L. I. 105 Park Pl., N. Y. City.

Root's Bee-supplies at Root's Prices

But f. o. b. Baltimore instead of Medina. Write for catalog L. No charge for drayage. ♦ ♦

RAWLINGS IMPLEMENT COMPANY
9 and 11 W. Pratt St. Baltimore, Md.

THE DANZENBAKER SMOKER

PAT. OCT. 3, '06, JUNE 4, '07

GOLD MEDALS
St. Louis Exposition, 1904
Jamestown Exposition, 1907



IS THE BEST,
STRONGEST,
COOLEST,
CLEANEST,
CHEAPEST,
AND LARGEST
SMOKER SOLD
FOR A DOLLAR

The perforated side grate seen above holds a removable, metal, asbestos-backed fire shell, preventing burning the tin off the outer case, and deflects the air at right angles, preventing back draft to the valveless bellows. The air, passing to the back and over the top, cools and expels the smoke, fanning the burning fuel at top or side till all consumed, giving cool smoke for hours from one filling. It can't clog. No top-heavy cap to choke with soot; no valve to fail; no holes shedding sparks or hot ashes.

Four years' sales prove its success beyond a doubt, expensive dies making it uniformly perfect as possible to devise. We confidently guarantee full satisfaction or refund the price.

Price, \$1.00; 3 for \$2.50; by mail, add 25c. each

Send address of yourself and Bee friends for 8-page leaflet on "Smoker," and facts about Bees and Queens, 80 pages, free.

F. DANZENBAKER, Norfolk, Va.

1884

1908

Root's Goods always in stock

FOR YOU

Twenty-two successful years manufacturing bee-supplies and raising Italian bees and queens. Root's Goods in Stock.

J. M. Jenkins
Wetumpka, : : Alabama

Dittmer's COMB FOUNDATION

is the best, not because we say so, but because the bees prefer it to other makes.

Dittmer's Process is Dittmer's

It has built its reputation and established its merits on its own foundation and its own name.

We make a specialty of working wax into foundation for cash.

Write for free catalog, and prices on full line of supplies.

GUS. DITTMER CO., Augusta, Wis.

Hammer Free!

With Every Order of Supplies of \$5.00 or Over.



This is the handiest tool for nailing up hives, frames, and all parts, or for opening up hives. Made of steel, nickelized.

Three per cent discount off all prices in catalog.

FULL LINE OF ROOT'S GOODS

NO CHARGE FOR DRAYAGE.

John N. Prothero
Dubois, .. Pennsylvania

At St. Louis

On a Line

to all points in the South and Middle West.

Send for our free illustrated catalog of
Root's Bee-supplies

We sell at factory prices.
Send us a trial order.

Beeswax Wanted.

Blanke & Hauk Supply Co.

DEPT. B.

1009-11-13 Lucas Ave. St. Louis, Mo.

Manufacturers and Jobbers of Dairy, Creamery, Ice-cream, and Poultry Supplies.

Northwestern Bee-keepers!

We are headquarters for the ROOT supplies for the States of Montana, Minnesota, the Dakotas, and Western Wisconsin.

You can save freight by ordering from this branch. A complete line of bee-keepers' supplies always in stock.

Secure a catalog at once.

BEES and QUEENS.—Your orders will be attended to.

The A. I. Root Company

H. G. ACKLIN, MANAGER

1024 Mississippi Street, St. Paul, Minn.

North Texas

Bee-keepers

will find Dallas the best point from which to purchase supplies. We have a carload of **ROOT'S GOODS IN STOCK**, and sell them at the Factory Prices. Don't forget that we can furnish any thing in the way of Field or Garden Seeds, Plants, and Poultry Supplies. Our large illustrated catalog for 1908 free on application. Mention GLEANINGS when you write.

**TEXAS SEED AND
FLORAL COMPANY**

Dallas, : : . Texas

The Time To Place

**Your
Order
for**

QUEENS

for spring delivery is here. Order now (with partial payment if not convenient to send all) and state when you want delivery. When ready for the queens, send the remainder. By so doing I shall be able to handle your order without the usual delays incident to the rush orders when the season is on.

Untested, in May and June,	1	6	12
Untested, after July 175	4.00	7.50

Selects, 25 cents extra. Tested, May and June, \$1.50; after July 1, \$1.25. Nuclei and full colonies ready May 1. Catalog for 1908 free. Send for one.

GEO. W. BARNES, Box 340, NORWALK, O.

Westwood Red-clover Queens

Are the bees that got the honey in 1907. Better try them for 1908. Nuclei and full colonies a specialty. Price list on application.

HENRY SHAFFER, 2860 Harrison Ave., Sta. L, Cincinnati, O.

PHARR'S GOLDENS

took first prize at three exhibits in 1907. We also breed Carniolans, three-banded Italians, and Caucasians, bred in separate yards and from the best breeders obtainable; guarantee safe delivery and fair treatment. Untested, \$1; tested, \$1.25. Address New Century Queen-rearing Co., Bercar, Tex. John W. Pharr, Prop.

W. H. Laws

is again on hand for the coming season with a larger stock of queens than ever before. He sold 400 queens to a New Mexico producer last May who wrote, "Your stock is far ahead of those Eastern queens I have been buying," and has placed his order for 1000 more of the Law queens to be delivered in May and June coming.

Others write that, if they had purchased all Law queens, their crop of honey would have been doubled. Testimonials enough to fill this book. If you are going to improve your stock, had you not better investigate?

Single queen, \$1.00; dozen, \$10.00; breeders, the best, each, \$5.00. W. H. LAWS, Beeville, Bee Co., Texas.

Bee and Poultry Supply House

We are now in position to offer the bee-keepers of New York and Vermont a full line of Bee and Poultry Supplies, etc., including Incubators, Brooders, Rochester Spray Pumps, Asphalt Roofing, etc.; also a general line of Hardware, Paints, and Oils. Will be pleased to send the different catalogs on request.

A. H. REEVES & CO.,

411 Main St., Watertown, N. Y.

Bell Phone, 11-1. Citizens' Phone, 381-0.

Bee-keepers' Supplies Sold

At the very lowest profit possible. Dovetailed hives, sections, etc.; complete stock, bought in car lots. Subscriptions given with orders. Send for my 32-page catalog, free. **W. D. SOPER, Jackson, Mich.**

Queens Queens

of the

FINEST POSSIBLE BREEDING

BRED BY

**F. J. WARDELL,
UHRICHSVILLE, OHIO, U. S. A.**

After many years' experience as head queen-breeders for The A. I. Root Co., I am now breeding bees at the above address. My stock is equal to any now advertised, and my long experience enables me to judge very accurately the value of any strain. Mine is the celebrated red-clover stock, which has given so much satisfaction to thousands of buyers for a number of years past. If you desire something very select for breeding purposes, write to me, stating your wants, and the same will be supplied. I have no cheap or inferior queens to sell. My prices for the season are as follows:

	May to June.
Untested queen	\$1.25
Select untested queen	1.50
Tested queen	2.50
Select tested queen	3.50
Breeding queens	6.00
Select breeding queens	9.00
Extra select 1 year old, 12.00	

No untested queens sent before May 15; but to secure your queens early in the season it is necessary to order now. Absolutely, all orders filled in rotation.

Queens

**FOR
1908.**

Finest Goldens bred in America. Send for my latest circular and prices — "and be convinced."

DANIEL WURTH, . PITKIN, ARK.

How are Your Bees?

Any Queenless Colonies?

If so, send for a queen at once. We can furnish by return mail fine tested queens, reared last fall, wintered in four-frame nuclei, three-band Italians, none better, \$1.00 each. Satisfaction guaranteed. Send for price list.

**J. W. K. SHAW & CO.,
Iberia Parish. Loreauville, La.**

**SAVE EXPRESS! by ordering
SAVE FREIGHT! your supplies
SAVE TIME! in Boston**

**H. H. JEPSON,
182 Friend St. Phone Haymarket 1489-1**

ITALIAN

Queens

and bees, and nothing but Italians. An improved superior strain is what QUIRIN-THE-QUEEN-BREEDER raises. Our stock is northern-bred and hardy. We just visited our outyards (all wintered on summer stands), and not a colony is dead to date (March 18). Some hives have lost scarcely a bee, so it appears. BROTHER BEE-KEEPER, how do you like such stock for hardiness? A party up in Maine got 50 nuclei of us several years ago. We just received a letter from him. He is after more of our bees, because last season he got 2200 pounds of honey which sold for 22 cts. per pound. Our stock is well known throughout the United States. Some of the largest yields reported can be traced to our stock. Over 20 years a breeder. Free circular and testimonials. Price of stock as below.

Prices of Queens before July.	1	6	12
Select queens	\$1.00	\$5.00	\$9.00
Tested queens	1.50	8.00	15.00
Select tested queens	2.00	10.00	18.00
Breeders	4.00		
Golden five-band breeders	6.00		
Two-comb nuclei, no queen	2.50	14.00	25.00
Three-comb nuclei, no queen	3.50	20.00	35.00
Full colonies on eight frames	6.00	30.00	

ADD the price of whatever grade of queen is wanted, with nuclei or colonies; nuclei ready about May 1st to 10th; can furnish bees on Danzenbaker or L. frames; pure mating and safe arrival guaranteed. We employ 400 to 500 swarms in queen-rearing, and expect to keep 500 to 1000 queens on hand ready to mail. Our Northern-bred bees are hardy, yet gentle; they will give you results. Address all orders to

QUIRIN-THE-QUEEN-BREEDER, Bellevue, Ohio

NEW ENGLAND
HEADQUARTERS FOR
BEE-KEEPERS

WE
ARE
HEADQUARTERS FOR

Bee-supplies

in this section, as we carry the largest and most complete line of Hives, Supers, Sections, Foundation, Bee-smokers, and other Apiarian Supplies, of any one in the New England States. We have a good stock of goods on hand now, and solicit your orders. Send postal for price list of

Bees and Queens.

W. W. CARY & SON
LYONSVILLE, MASS.

**COLDEN-ALL-OVER and RED-CLOVER
ITALIAN QUEENS**

My stock is the result of years of careful selection, and is equal to any in the country. The prices are only such as to insure long-lived, prolific queens, whose workers will be hardy and good honey-gatherers. Write for 1908 circular. PRICES. 1 6 12

Untested \$1.00 \$5.00 \$9.00
Select untested 1.25 6.50 12.00
Tested, \$1.75 each; select tested, \$2.00 each.
By return mail after May 25, or money refunded.

Wm A. Shuff, 4426 Osage Ave., Philadelphia, Pa.

Taylor's Strain of Italians is the Best

Long tongues and goldens are the best of honey-gatherers; 19 years a specialty, breeding for the best honey-gatherers. Untested, 75 cts. each, or \$8.00 a dozen; tested, \$1.00 each, or \$10.00 a dozen; select tested, \$1.50 each. Breeders, the very best, from \$3.00 to \$5.00 each. We sell nuclei in full colonies. Bees in separate yards. Safe arrival guaranteed. Send all orders to

J. W. TAYLOR & SON, Beeville, Bee Co., Texas.

Italian Bees and Queens

from Root's red-clover stock of golden Italian queens. Untested, 75 cts. each; six, \$3.75. Select untested, \$1.00 each; six, \$5.00. Tested, \$1.50 each; six, \$8.00. Select tested, \$2.00. Two frame nuclei, with untested queen, \$2.25. Orders filled in rotation. Send all orders to **E. A. SIMMONS, GREENVILLE ALA.**

NOT CHEAP QUEENS, BUT QUEENS CHEAP

500 Best Strain Italian Queens Ready to Mail March 1st.
Untested queens in lots as follows: 1, 75 cts.; 6, \$4.20; 12, \$7.80.
Tested queens in lots as follows: 1, \$1.00; 6, \$5.70; 12, \$10.80.
Breeders' queens in lots as follows: 1, \$2.25; 3, \$12.00.
Nuclei with untd' queen: 1-fr., \$1.75; 2-fr., \$2.25; full colonies, \$4.75.
Nuclei with tested queen: 1-fr., \$2.25; 2-fr., \$2.50; full colonies, \$5.
Also dealer in bee-keepers' supplies. Root's goods. Ask for cat'g.
W. J. LITTLEFIELD, LITTLE ROCK, ARK.

"If goods are wanted quick, send to Pouder."
Established 1889.

The Story of Joe, of Idaho.

By the Bee Crank.

When Joe and Ida settled down
In Idaho forlorn,
Joe won renown—he beat the town
At pool from night to morn,
And, sad to say, he slept by day
While Idahoed the corn.

One day she read a Pouder ad.,
And then she found her tongue;
Said she to Joe, "Now you can go;
No longer will your Idaho: [ey,"
I need the money, it's me for hon—
And Joe—well, Joe was stung.

The fact of the matter is, Ida was a better business man than Joe. She sent here for an equipment of Danzenbaker hives, foundation, sections, a veil, and a lot of other material of Root quality. With this cue from Ida,



Joe has improved his habits and is doing much better.

My catalog tells all about these goods, and it is free. If more convenient, make up your order from Root's catalog, as prices are exactly the same, and I ship these goods from Indianapolis at factory

prices. I shall consider it a favor if you will send your beeswax here, as I pay highest market price, cash or in exchange for supplies.

Walter S. Pouder,

513-515 Massachusetts Avenue, Indianapolis, Ind.

GLEANINGS IN BEE CULTURE

Published by The A. L. Root Company, Medina, Ohio

E. R. ROOT, EDITOR A. L. BOYDEN, ADVERTISING MGR.
H. H. ROOT, ASST. ED. J. T. CALVERT, BUSINESS MGR.
A. I. ROOT, EDITOR OF HOME DEPARTMENT

Vol. XXXVI.

APRIL 1, 1908.

No. 7

STRAY STRAWS

by Dr. C. C. MILLER

E. D. TOWNSEND finds that greatly contracted entrances at first spring flight hinder bees drifting and massing at a few colonies, p. 346. Same here.

TO LENGTHEN the blooming period of any honey-plant, get plants from further north or south. For example, get lindens from the north for earlier bloom, and from the south for later bloom.—*Deutsche Bzch.*, 32.

“BOTTOM-BARS with only $\frac{1}{4}$ -inch space between them would retard communication between stories very much,” p. 343. And yet with such spaces my queens seem to pass readily up and down when keeping brood in two stories.

THE ADVANTAGE of wide bottom-bars is asked for, page 346. They are a distinct aid in keeping bees from building combs between two stories. But there has always been some question in my mind whether this advantage were not offset by disadvantages. Most assuredly I would not have them if I wanted to look up between bottom-bars.

“QUEENS never react either peacefully or hostilely toward strangers or toward bees belonging to the hive,” page 232. I am sure there are exceptions to this rule. I once saw a queen grasp a worker, and almost immediately it was a dead worker. Others have reported that one difficulty in introducing queens was because of their hostile attitude toward the workers.

I DON’T KNOW how bees know so much, but I think it is the general understanding that they are far-sighted enough to be more lavish in starting brood in the spring with a big lot of honey in sight than with only enough to run from day to day. So give me a hive heavy with honey in the fall so not the

slightest thought need be given as to feeding again before the next harvest. —

A \$6.00 BREEDING-QUEEN was bought by A from B, and died several months after safe arrival, and introduction. A wants B to replace; B refuses, but is willing as a compromise to send another good queen. A seems to think B ought to do better, p. 339. I suspect a whole lot of queen-breeders will throw up their hands in amazement at that sort of ruling. I’d like to know why B is held responsible to do any thing in the case, and how old that queen must be before his responsibility ends.

JAMES C. WHITE is wisely advised, p. 369, to tier up to prevent swarming. Let me add an item: Shove the second story either back or forward so as to make a $\frac{1}{2}$ -inch crack for ventilation. Do this with each added story. This will double the security against swarming. [You are probably right, that this extra ventilation will aid materially in the prevention of swarming. But is not so much ventilation an indirect loss in that it requires a large portion of fielders to stay at home to keep up the necessary body heat—that is, comb-building temperature? Understand, we do not claim that you are wrong on this point; but, to use a familiar phrase of yours, “I don’t know.” Who does?—ED.]

G. M. DOOLITTLE, p. 341, will not admit that a difference in comb-building makes a difference in the number of bees going to the field. Possibly he is right, but there is a fine chance for argument on the other side. Under average conditions a bee will not go afield under sixteen days; but when there are no older bees for the work, a bee five days old will become a fielder. Now take two strong colonies alike in all respects except that one of them has all its surplus combs to build, and the other none. Don’t you believe that the exigencies of the case, seeing that a bee can go afield when not half of sixteen days old, will send more bees afield from the one colony than the other?

JOHN HENDRICKS quotes from a religious work: “The propagation of their species, by butterfly, bee, and moth, without the custom-

ary presence of male companion, is a discovery corroborative of the science of mind; because these discoveries show that the origin and continuance of certain insects rest on a foundation apart from sexual conditions." And he asks whether this is true of any bee and of other insects. No, it is not true of any bee or other insect. Yes, it is true of our honey-bee and of other insects. It is most emphatically not true in the sense in which it will be understood by the ordinary reader, who will understand it to mean that one could continue his bees from year to year if he never allowed a drone to appear. It is true in the sense that *some* bees may be brought into life without the intervention of drones; but bees so produced will all be drones. No queen or worker can proceed from an egg unless that egg is fertilized.

LOUIS SCHOLL says, p. 343, "contrary to the arguments of some of our authorities, I believe that hives well painted will last very much longer, keep in shape better, and look nicer than unpainted ones." Who are the authorities, Louis? I didn't suppose any one believed differently. [The authorities referred to must be yourself and Mr. Doolittle. While it is very true that you are in harmony with the proposition stated by Mr. Scholl, yet you have, if we remember correctly, made the statement that it did not pay you to paint your hives. While this statement, strictly speaking, is not in conflict with the one made above, yet it impliedly is. If we remember correctly your real contention is this: That it does not pay you to paint your hives; for by the time that they will be of no further service for lack of paint you probably will want something of a different pattern, involving a different system. In your forty years of bee-keeping you have changed your hives once already. In the period mentioned you would have gained nothing in dollars and cents to paint the hives. This is as we understand your position. Are we right?—ED.]

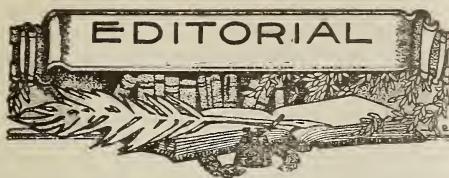
"Requeening is something that I have believed could be most profitably left to the bees; but I think those on the other side of the question have the best of the argument when it comes to the improvement of stock by selection. If we allow each colony simply to requeen itself when the queen becomes old, there is not much likelihood of the young queen being any better than her mother." —*Review*, 84. It is a mistake, Bro. Hutchinson, to assume that those who advocate letting queens do their own superseding allow *each* colony simply to requeen itself. I think no one has more earnestly advocated improvement of stock than I, at the same time allowing queens to do their own superseding; but not *each* queen. Any queen not coming up to the mark is replaced by a better one. Please tell me why that doesn't give just the same chance for improvements as the plan given by S D Chapman. *Review*, 73. Mr. Chapman removes old queens a week before the close of the raspberry flow, letting each colony requeen itself, except

the inferior ones, to which he gives choice cells. I do much the same thing, only I don't cut them off at a year old. Let me say in passing that Mr. Chapman's plan for annual requeening is good, excellent, and I'm not so cock-sure that it may not be better, at least for many, than allowing queens to live longer.

I DON'T WANT to say a word belittling the excellence of O. L. Hershiser's plan of management in the spring, p. 348, but I do think he greatly underestimates the capacity of certain colonies in one of his assumptions. He assumes that a colony with from three to four Langstroth combs fairly well filled with brood five or six weeks before the commencement of the main honey-flow (white clover), with a good honey season and a good location, but no fall flow, "will gather enough honey on the average for winter stores, but no surplus." If such a colony did no better for me, with no attention except putting on and taking off sections, I would count that there was a queen whose head needed to come off, and would feel greatly dissatisfied with less than 50 lbs. surplus, and would be rather expecting 100. On the other hand, the editor greatly overestimates, p. 347, when he talks about "getting all the queens to laying to their full capacity from the time manipulations are begun in early spring." With one-fourth of the colonies "weak, with from two to three L. frames containing brood," will the queen in those weak colonies lay more than one-fourth of their full capacity? [We will let Mr. Hershiser answer for himself. As to our statement, it would appear to us that, under the conditions of the very weak and the very strong colonies, each set of queens could with proper coöperation on the part of the apiarist, lay to the extent of their full capacity; but the queen of the weak colony will have a smaller cluster and fewer frames at her disposal. But as these are easily taken out after being filled with young brood we do not see why she would not be able to lay in a smaller room as many eggs as a queen having a strong force of bees. Strictly speaking, no queen ever lays to her full capacity. If she is a good one she will often get ahead of her bees. It is then that the apiarist will intervene in her behalf.—ED.]

MAJESTIC Lake Tahoe, amid the snow-capped Sierras, is soon to be taken in charge by Uncle Sam's engineers who are in the Reclamation Service. The level of the lake is to be raised by building a dam across its outlet, which is the head of the Truckee River. The idea is to control the water so as to irrigate a large extent of land which is now a complete desert. Nowhere has bee-keeping been more successful than in Nevada where irrigation is practiced. Neither in quality nor in quantity has the honey been excelled. It is, therefore, a pleasure to see that the national government proposes to increase greatly the area of available bee territory.

W. K. M.



WE have found it necessary to continue our special series of spring articles in this number. At the same time, we enlarge it enough to take in another installment of the series by Dr. von Buttel-Reepen. This should be read with unusual care, as it is both interesting and valuable.

THOSE whose subscriptions expire or have expired will please read the editorial on page 277, Mar. 1st. Except under certain conditions we shall not be able to continue the journal longer than the time paid for. If you can not send a remittance at once, but desire the journal to be continued, please let us know, stating when you will be able to pay up.

A FAVORABLE SPRING THUS FAR.

SPRING thus far is favorable, in that the month of March has not been warm, but chilly most of the time. If we do not get warm weather before the middle of April in our locality, we expect nice weather thereafter, and a good year for bees. If it is a warm March, followed by a cold April, it works havoc with bees that are well started in brood-rearing.

MORE GLUCOSE.

LATE press despatches say that the immense glucose-factory at Marshalltown, Ia., has been purchased by the Western Grocery Co. The latter is credited as being worth \$5,000,000, and operates branch houses in several western cities. The plant at Marshalltown is on a gigantic scale, and ought to turn out an enormous amount of glucose in the course of a year. The Iowa bee-keepers may certainly expect to see lots of "near honey" sold in their vicinity this year.

W. K. M.

SPRING FEEDING AND THE COLOR OF PAPER WINTER CASES.

THE accumulating testimony seems to show that spring feeding, to stimulate, is a practice that should be discouraged. The best time to feed is in the fall, at which time the colonies should be fed liberally and in big feeds.

There seems to be a difference of opinion as to whether winter cases should be covered with *dark* or *light* colored papers. In view of the fact that black absorbs heat when the sun shines brightly, warming up the colony, we have used a light-colored paper—one that would be less subject to the effect of the rays of the sun. The time was when poultrymen advised the use of glass in poultry-houses; but the effect of this was to make

the building unnecessarily warm on bright days. The extremes of temperature from a sunny to a dark day did more harm than good. The same principle will apply in the case of a dark or light paper for winter cases.

Some years ago we conducted some elaborate experiments, painting some of our winter cases black and some red. But we found the dark colors would drive the bees out on a bright day, yet too cool for them to stay out without getting chilled. We have for years advised painting chaff hives white.

ARE WE SACRIFICING DESIRABLE TRAITS FOR AN UNIMPORTANT CHARACTERISTIC IN OUR BEE-BREEDING?

WE desire to call attention to the excellent point made by C. F. Bender, in this issue, where he says the constant temptation of a queen-breeder is to breed for beauty alone. This quality, even if desirable, should be placed, he thinks, at the bottom of the list of good breeding points; "for," he says, "the more qualities we breed for, the less we get of each particular quality." This is only another way of saying that stock with extraordinarily bright-yellow color must have sacrificed correspondingly in the development of one or more other good points. A race horse, for example, is good for nothing but speed. Other desirable qualities have been sacrificed for the one thing—*speed*.

There is this to be said, that *color* in bees is the only quality that can be made to stand out prominently, unless it be temper; and it is the only one that shows at once that the queen-breeder has accomplished some particular end.

SUGAR AND HONEY AS PRODUCERS OF MUSCULAR ENERGY.

THERE is a well-nigh universal opinion that such foods as sugar and honey are almost valueless as producers of muscular energy. But read what the highest medical authority in the world, the *London Lancet*, has to say on the subject:

Sugar is one of the most powerful foods which we possess, as it is the cheapest, or, at any rate, one of the cheapest. In muscular labor no food appears to be able to give the same powers of endurance as sugar; and comparative practical experiments have shown without the least doubt that the hard physical worker, the athlete, or the soldier on the march, is much more equal to the physical strain placed upon him when he has had included in his diet a liberal allowance of sugar than when sugar is denied him.

Trophies, prizes, and cups have undoubtedly been won on a diet in which sugar was intentionally a notable constituent. It has even been said that sugar may decide a battle, and that jam after all is something more than a mere sweetmeat to the soldier. The fact that sugar is a powerful "muscle food" probably accounts for the disfavor into which it falls, for a comparatively small quantity amounts to an excess, and excess is always inimical to the easy working of the digestive processes.

Sugar satiates: it is a concentrated food. Where sugar does harm, therefore, it is invariably due to excess. Taken in small quantities, and distributed over the daily food intakes, sugar contributes most usefully in health to the supply of energy required by the body. And it is a curious fact that the man who practically abstains from sugar, or reduces his diet to one almost free from carbohydrates in favor of protein foods such as meat, often shows feeble muscular energy and an indifferent capacity for physical endurance.

Honey comes under the same category as sugar, with this difference: It is almost ready to pass into the blood without further change; and it is far more palatable than sugar, since it possesses an almost priceless aroma which stimulates the appetite and promotes digestion. If a person has the means he should, as far as possible, use honey where others use sugar.

Some say honey is not a necessity; but such people are using sugar, probably to excess. Sweets are an absolute necessity to the civilized man. No race can long exist without sugar in some form, and civilized men are the greatest consumers of it.

The Secretary of Agriculture over in Ontario recently stated that one pound of honey is equal in dietetic value to five pounds of pork; and such a statement is well within the mark. Modern science abundantly confirms it.

W. K. M.

LIQUEFYING CANDIED HONEY AT A COMPARATIVELY LOW TEMPERATURE IN A LARGE INCUBATOR.

As reported on p. 278 of our March 1st issue, we have been conducting some experiments, and expected to give the conclusion of them in our last issue; but, unfortunately, the incubator "went bad," the temperature going up so high as to melt the wax of the comb, and consequently we had to start all over again. We have a very large incubator, and in it we placed sections of comb honey candied almost solid. The honey of some of these within ten days was completely liquefied without any apparent damage to the comb; others, at the end of two weeks, were not brought entirely to a liquid state; but the top of the comb shows in some cases some slight stretching, while the bottom shows a corresponding compression or sagging. The temperature has not gone higher than 105° nor lower than 103. The incubator in question is one of the standard makes, large enough to use two lamps at a time.

We are not entirely satisfied with the results thus far, for we believe that, with a slightly lower temperature, say 103°, extended over a longer period, there would be no stretching of the combs; and the honey, practically all clover, could be entirely liquefied. We have demonstrated this much—that comb honey *partly* candied, that is, the honey-can, at a temperature of 105°, be liquefied in four or five days; in other words, we can arrest the process if we see it starting, and bring the honey back to its normal state, and that, too, without injuring the combs.

Candied comb honey so treated is delicious. The honey is thick and waxy, and as clear as it was the day it was gathered by the bees. The flavor is in no way impaired, and the comb surface seems to be as perfect as when the bees left it.

Of course, an incubator in a commercial way would be impracticable; but we are of the opinion that a honey-room large enough

to hold several thousand pounds could be equipped with steam or hot-water radiators so that the temperature could be maintained at about 104° for a period of ten days or two weeks. If the progress is watched carefully, and the temperature checked when it begins to get too high, hundreds of dollars may be saved in lost comb honey that would not have brought otherwise more than the rendered wax and an inferior quality of honey secured through the process of rendering.

We will conduct our experiments further; and if they prove satisfactory we think it will be possible for a dealer or large buyer to make good money by buying up candied comb honey and bringing it back to its normal state in a specially heated room. There is money in this proposition—lots of it; and we suggest that others having incubators—and we must have thousands of subscribers who are supplied with them—try this experiment in a small way and report results.

SHOULD THE SALE OF SPLIT SECTIONS BE DISCOURAGED? ARE THEY LOSING THEIR POPULARITY IN ENGLAND AND IRELAND?

A SHORT time ago there appeared in these columns a discussion of the relative merits of split sections (that is, sections split through the top and both sides) and the ordinary sections in which the foundation is fastened in any of the standard ways. We took the ground that the first mentioned, owing to the foundation protruding through the sides and tops, would, when they fell into the hands of consumers, give rise to the old comb-honey canard which we have been fighting for years and years. For that reason we questioned very much the wisdom of pushing their sale. Mr. Hand, on the other hand, took issue with us, saying that he had sold thousands of such sections, but never once had it been said that his comb honey was manufactured.

Along about this time, Dr. Miller, in one of his *Straws*, stated that the popularity of split sections in England was waning. We remarked that, from the evidence in our office, it was getting to be increasingly apparent that the demand for them in England was decreasing. Referring to this the editor of the *Irish Bee Journal*, in his issue for March, has this to say:

It is quite new to us to hear that British consumers object to the split section, and we are bound to say that the assertion is altogether contrary to our experience in marketing comb honey in England. Nevertheless, a statement of the kind, coming from two such eminent men, seemed to us to demand investigation; for, if it were justified by the facts, honey-producers who supply the English market would need to revise their method of preparing sections. Accordingly we placed ourselves in communication with a large number of the leading British and Irish producers, all of whom assure us that their experience agrees with our own. They have never heard of any objection to split sections on the part of buyers in England, nor of any depreciation of the value of comb honey marketed in such sections.

We believe it to be only fair to Mr. Hand and the advocates of split sections that the

statements be given their full weight. But the comb-honey canard never had the continuous circulation over in England that it has had here. In this country it has been the one thing that has kept down the price of comb honey, because the public were suspicious of *all* honey in the comb and would not buy. Now that this hoary canard has all but died a natural death it would seem as if we might be taking long chances to put out a style of section that would give even the faintest suggestion of the so-called "manufactured comb honey." It is our honest conviction that it would be very wise to go slow, especially as it now appears that we can put in full sheets of foundation cut to fit in regular sections.

SPLIT SECTIONS OLD.

We find by our orders in the manufacturing department that the sale of split sections in England is beginning to ease up. Whether other manufacturers are having an increased trade we are not able to say. We also find that the sale of split sections, as compared with all other kinds, is only about 25 per cent of the total number sold in Great Britain. The great majority, apparently, in the mother country at least, favor solid sections and using one or more of the different methods of fastening foundation to the wood. When it is remembered that the split section was first illustrated and described by Mr. Samuel Simmins, in his book "A Modern Bee Farm," in 1887, and then further described in subsequent editions of his book, 1893 and 1904, it would appear by this time that they should have had a larger proportionate sale.

Later.—Just as we go to press, it is, perhaps, proper for us to say that we have been looking over several supers of split sections, in which foundation was put in on the J. E. Hand method some months ago. We were surprised to note that the foundation had buckled in many of the sections. Then we looked over some regular sections, in which foundation had been fastened on all four sides. These were buckled also. In both cases extra-thin foundation was used. Possibly the buckling would not have occurred if we had used the grade called "thin paper."

If the Yoder plan of fastening to the top, and part way down the sides, with a gap of $\frac{1}{8}$ inch at the bottom, will prevent this buckling, the problem is solved.

BEE-KEEPERS FURNISHING ALSIKE-CLOVER SEED TO LOCAL FARMERS.

A YEAR ago we furnished alsike-clover seed free of charge to all farmers within a half or three-fourths of a mile of any of our bee-yards. We did this to get it more generally introduced in our vicinity; but we did not then anticipate that so many of them would jump at the chance as they did. Having made a general offer we stood by it, even though it took over \$150 worth of seed to supply the call for it. Well, the result is that alsike-clover seed has been pretty gen-

erally scattered all over the territory within a mile of our bee-yards.

This year we expect there will be just about as much alsike distributed, in spite of the fact that we do not furnish it free, but charge half price.

During the last few years farmers have been learning the value of alsike as a forage-plant, and many of them are sowing it with their timothy to increase the food value of the hay. In a trip about a year ago through the heart of Michigan we noticed that the farmers there were sowing alsike with timothy; for every field of timothy that we could see had alsike growing with it.

In favor of alsike it may be said that it takes *only half the amount of seed to cover a given area* that red clover does; it has a *higher feeding value*, and, what is more, it will *stay in the ground for three or four years*, while red clover will run out in a single year.

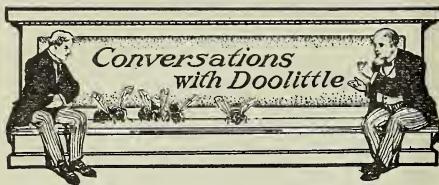
It has been observed by bee-keepers that white clover, owing to intensive farming, has been gradually running out; but to offset this, alsike is taking its place; and when farmers come to know its real value, and that it costs only half as much to sow an acre of it, it will be grown more largely than at present.

Every bee-keeper in this country, where alsike will grow, should make arrangement to furnish seed, either at half price or at cost. He should take pains to go among his farmer friends and explain its advantages, and urge them to grow it. If he continues this policy a few years he will have a locality that will be one of the best for honey. This is not mere theory, for we have plenty of facts to prove it.

The efforts that have been thus far made to increase the length of the tongues of our bees have not accomplished a great deal as yet. One reason for this is the difficulty of controlling the male parentage, with a view of accentuating increase of tongue-length. But if we can substitute alsike for red clover we can solve the whole proposition.

Alsike-clover hay mixed is beginning to have a special market value. For race horses it is considered the best hay obtainable. If it is good for this class of animals it ought to be good for others. Dairymen who have tested it have learned that it increases materially the quality and quantity of milk.

Bee-keepers everywhere should now get busy to see that a supply of seed is obtained, and furnish it at cost or half price. We furnish it free of cost in case it is to be sown where a field abuts our apiaries, or at least comes within a hundred yards or so of them. But where seed is given away it should be *plainly stipulated* that it be *sown in the regular way*, on cultivated ground, and not thrown broadcast on the top of the ground of regular meadow land. While much of the seed will spring up, much of it will be lost. Where one pays half price for his seed we may rest assured he will not waste any in that way.



BROOD TOUCHING THE FRAME-BARS.

"I want to talk a little about brood-chambers this morning, Mr. Doolittle. Up to last year I always used a brood-chamber holding frames 12 inches deep, and I seemed to have trouble in getting the bees to work in the sections."

"What did you think was the trouble, Mr. Jones?"

"The bees seemed to store so much honey at the top of the brood-combs, above the brood, that it seemed to make the distance too great between the brood-nest proper and the sections above, and on account of this they did not enter the sections readily."

"And you think that was the trouble?"

"Think! I almost know it was. A year ago last winter I made all my new hives so that the frames were only ten inches deep, inside measure; and when colonies had been in them a month or so it was no uncommon thing to have these combs with the brood touching the top-bars to the frames all along the edges of the comb."

"Were the results in section honey any better?"

"Nearly double the amount of section honey was secured from such hives. The old ones did about as well as ever, but hives where the brood came up all along the tops to the frames just piled the honey in the sections."

"Then I suppose you would call this last hive of yours a good one."

"Yes, I do; and I came over to ask you if you think I would be making a mistake in making my old hives over like these."

"I do not think you would, for having the brood extend to the top-bars of the frames in the hive is one of the great secrets in *comb-honey* production; and I claim that the main reason for your new hive being a good one is because you can thus secure the brood in the frames. Few seem to realize that, unless the hive is so filled with brood at the commencement of the honey harvest that it comes out to the frame-bars in the most of the combs, there is no assurance of a good crop of honey, no matter how profusely the flowers bloom, nor how abundant the secretion of nectar in those flowers."

"But do you think that the brood touching the top-bars to the frames has all to do with it?"

"No, not altogether. I always thought that this brood coming up to the top-bars caused the bees to enter the sections as soon as any nectar was coming in from the fields, on the principle that it is nature's way for the bees to store their honey above the brood.

But this does not entirely control their going into the sections. There is something else which has a great bearing on this part of the matter."

"What is that?"

"Unoccupied comb. Plenty of unoccupied comb in the brood-chamber, at the commencement of the honey harvest, means that there is not apt to be plenty of honey in the sections. Bees will always store honey in any comb which is completed (and not occupied in some other way) before they will go to building comb, or even drawing out foundation in the sections; and as long as there is such unoccupied comb in the brood-chamber they will commence to store honey there, no matter how much we may wish it otherwise; and having once started storing in the brood-chamber they are always more or less reluctant about going into the sections."

"I supposed the trouble was that the bees had to pass over the honey in going into the sections."

"That had some effect, without doubt; but that was not the whole trouble. To give the best results the combs remaining in the brood-chamber at the commencement of the honey-harvest should be literally filled with brood, which term I use broadly; for where brood is in abundance, there must also be some pollen and honey to supply the wants of that brood; and where no more is on hand than is needed for the wants of the brood from day to day, such honey and pollen are virtually the brood. But, above this, there should be room for nothing at the commencement of the harvest. Empty cells of comb, even to the amount of storing five pounds of honey, will tell to the disadvantage of the section honey. With the hive or brood-chamber literally full of brood, as explained above, at the commencement of the harvest, the bees *must* put their first loads of nectar in the 'baits,' which should be in the first super of sections put on such hives; and with the storing of this first nectar in these baits, work is at once begun in the sections surrounding these, the comb foundation being drawn out where the sections are filled, or work on the starters progressing finely where only starters are used; and having once thus begun in the supers, the work is continued to the end of the harvest."

"Well, there is more to that part than I had imagined, even in my enthusiasm."

"Before we leave this matter let us consider unoccupied combs in the brood-chamber, and see what happens. With the unoccupied comb the bees will commence storing their first loads of nectar in the unoccupied cells; and when these are nearly full the cells will be drawn out or lengthened all through the hive, which unfitts them for the rearing of brood; and as young bees emerge next to these drawn-out nectar-filled cells the brood-cells will be drawn out, thus crowding out the queen more and more, till at the end of the season we have little honey in the sections with few bees in the hive for winter. Now this makes all the difference imaginable be-

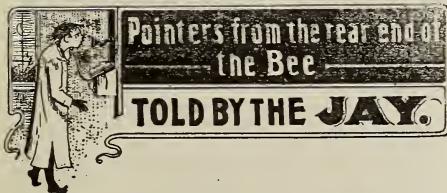
tween success and a mere pittance from our bees when it comes to section honey. With extracted honey the supers are generally filled with comb, so the first nectar goes into the supers, and the queen can spread herself all she wishes, often doing this to the complete exclusion of honey from the brood-chamber, without any effort on the bee-keeper's part."

"But what effort can the bee-keeper make when working for comb honey?"

"Just what you have been doing with your new hives. Cut down the frames, which reduces the size of the brood-chamber, till the queen and bees, of their own accord, have the hives literally filled with brood when the harvest commences. Or do what I prefer — use a ten-frame Langstroth hive, and in their connection use one, two, three, or four division-boards, just in accord with the prolificness of the queen. At the commencement of the honey harvest I take away all the combs in the hives which are not occupied with brood, and insert in their places a division-board which is simply a piece of an inch board of the size of a frame, with a top-bar to a frame nailed to it, and thus bring the brood in the hive to where I wish it, whether the queen is very prolific or otherwise."

"Do you treat all of your colonies that way?"

"No. Half or more of the queens are so prolific that there is no need of any division-board; many more require only one board, while a very few require more than two. With the two this practically makes an eight-frame L. hive, which hundreds of our best bee keepers recommend. But I would far rather have a colony go into the honey harvest with only five combs filled with brood and five division-boards than to have the same colony with five frames with brood and five frames with nearly all empty combs."



THE SWARMING PROBLEM.

I have been requested to make clearer my method of doubling up swarms as described in the Oct. 15th issue of GLEANINGS. In reading over this article I must confess that, in endeavoring to be brief, I expected the reader to take too much for granted. The point in question was concerning the clustering of the swarm, "That it should be allowed to cluster near the old stand," etc. While the swarm is in the air I catch the clipped queen, which is usually found near the hive

energetically climbing all the weeds and grass in the neighborhood. I then put her into a Miller queen-cage. If there is a branch of a tree near the old stand I tie the cage to that. Then I remove the old colony; and the swarm, as it returns, will cluster around the cage. The bees belonging to the old hive will, as they return from the fields, cluster with the swarm as if they had originally intended to be a part of the game.

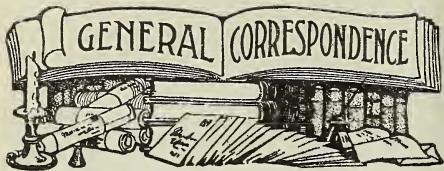
I have tried several modifications of this plan. If no tree stands near by I place an empty hive on the old stand and place the cage containing the queen in this hive. The bees will soon return, and at once go into the hive. Then at night I dump the bees in front of a hive that is not doing very good work in the supers. If I have a young queen in a nucleus (I usually have such during the swarming season) I requeen the old colony at once. If there is no young queen on hand I give the old queen back to the old colony till a young one can be raised.

If my future experience with this method works as well as it has during the past three years I shall look for nothing better in the way of handling new swarms. It is scarcely any work. You have no increase. The old colony will usually gather plenty of honey to winter on.

The united swarms will make extra fancy honey on account of there being so many in the hive; and where a strong swarm is put with one not doing good super work, *more honey will be obtained than if there had been no swarm*, because the entire new swarm is put to work in the supers.

Another plan I have tried in a limited way gave the best of satisfaction in handling swarms when it was necessary for me to be away from the yard. In other words the conditions were the same as they would be in an outyard. I look through the bees, searching for cells by raising up the hive and looking at the bottom of the frames. When I found one that was preparing to swarm I simply moved it to a new location and gave the super it held to the hive on the stand from which the old one was removed. I keep two hives on the same stand. The returning bees will go into the other hive and work with the strange bees as well as they did before. The result has been in every case that the hive that wanted to swarm gave up the idea at once and immediately tore down all cells. This has not given quite as good results in comb honey as the first method named, as you can not give this force of bees to any weak colony you might wish to. Then, again, I find that, as a rule, more bees will go out with a swarm than will naturally return to their old location when their hive is moved.

The plan I am going to try next season will be to make a small tripod out of light stuff and lay a light pole across it. The cage containing the queen will be hung upon the end of this pole, and the bees allowed to cluster there. Then in the evening I will take the bees on the end of the pole and dump them as previously described.



SPRING DWINDLING.

Three Principal Causes, and the Remedies;
Tin Markers to Show the Age and
Value of the Queens.

BY E. W. ALEXANDER.

During the first month after taking bees from their winter quarters there are usually more colonies lost than during the other eleven months of the year; and it seems really harder to bear the loss then than at any other time, for we know that, if we can keep them alive and in their hives during those chilly, cloudy, changeable days of early spring, we can soon have them good colonies for the coming summer. While there are several conditions that help to bring about these disastrous results, there are three that stand out as the principal causes of spring dwindling.

The first cause is an old queen—one that stopped laying early the previous fall. Colonies with such queens become weak in bees during the latter part of winter, and, not being able to keep their hives warm enough, they are soon affected with dysentery, and, after they are set out, they waste away until none are left. This cause of spring dwindling can be easily prevented by introducing young queens early in the summer, so they will have a fine lot of brood at the close of the season.

Another serious cause is poor honey for winter stores. This is a more frequent cause, and far more disastrous than the loss from old queens, for the losses from poor winter stores affect all colonies alike, and the poor bees die by the thousands while in the cellar, and still faster when first set out, until nearly every colony is dead.

One winter I lost 417 colonies from this cause out of 432; but we can now prevent all loss from this source by giving our bees sugar syrup to winter on in the place of unsuitable honey.

Another very serious cause of spring dwindling is the desire of the bees to fly on those changeable days I spoke of above. This loss can also be almost wholly prevented by placing the hives, when taken from the cellar, so the entrance will *face the north*; then in addition to this have a shade-board so it can be easily placed where it will shade the entrance still more, and somewhat darken it. To prevent still further their desire to fly on cloudy days, give the colonies about a pint of warm sweetened water every night about dark. This will encourage them to breed fast, and at the same time prevent thousands from becoming lost on chilly days in search

of water. If you prefer to have the hives face some other direction it is but a short job to turn them around to any point after the changeable weather of early spring has gone by. Please try this method, and you will find that the bees will have but little desire to fly except when the temperature is warm enough to fly safely in the shade; consequently the old bees are saved until the colony has a fine lot of maturing brood.

As experience enables us to cast aside the fatal results of spring dwindling, it seems as if we had taken another step forward along the line of progress. The cares and anxiety of another busy season will soon be here, and our plans should be well matured for the coming summer. Have you secured your necessary help and your supplies? Do you know how much increase you will make and how you will make it? Have you decided whether you will rear your queens or buy them? If you intend to purchase, have you sent in your order? If not, attend to this at once. I find that some of our best queen-breeders have now (Feb. 25) all the queens engaged that they can rear the coming season. These are important matters to look after, and should be attended to very soon.

HOW TO KEEP THE RECORD OF THE QUEENS.

I am frequently asked through the mails what system we have adopted to keep a correct record of the age and quality of our queens. I think I have answered this question before in some of my former articles; but it is so easy and practicable it will bear repeating for the benefit of those who have not seen it. We cut out a few hundred pieces of tin, about $1\frac{1}{2}$ inches in diameter. Some we made round, some half round, and some square; then with a small wire nail or a bradawl we make a hole in the center of each piece. Every summer we use a different-shaped piece of tin to mark all the hives that have queens of that summer's rearing. Two years ago we used the square pieces; last year we used the round pieces; this summer we will use the half-round. We tack one on the front right-hand corner of each hive, with a carpet-tack. They are easy to remove; and whatever hive a queen occupies during her life, that tin tag goes with her. In marking our common ordinary queens the tag is placed on the corner of the hive about two inches above the bottom-board. If the queen is better than ordinary, the tag is raised up the corner according to her real worth. If she is a little off in any way we put the tin toward the other side of the hive, according to how poor she is. In this way it takes only a moment to mark the hive so that, at a glance, we can tell at any time we see the front of a hive the age and quality of the queen it contains.

We have practiced this method for about forty years, and during this time we have tried some others, but have never been able to find another so easy and practicable as this.

If you will try it I am sure you will never again neglect this very important part of the business.

You may talk and write about the importance of a good location, also of the knowledge and experience of the man in charge, each being very essential; but to have a good queen of a good honey-gathering strain in every colony is of more importance than any other one thing connected with the business; for if the colonies have poor old queens that can not be induced to keep their hives half full of brood we might as well give up at once, for we shall get little or no surplus, and our hopes will be blasted. We should continually try to profit by our past experience, not only in caring for our bees, but in disposing of our honey. Don't be satisfied with the results of the past, but strive to make the coming season the most profitable one you have ever had.

Delanson, N. Y.

[We notice that our correspondent recommends facing the hives in the spring toward the north, with a storm-door or lean-to board placed in front of the entrance to shut out prevailing drafts. There may be something in this, because we have observed in the last few days that, wherever the sun strikes the entrances, storm-door or no storm-door, the bees will fly out of the hives with such entrances before they will come out of hives having the entrances face toward the north. But over against this we have often observed in the case of our outdoor-wintered bees that colonies with entrances toward the north very often die, and we have attributed this to the north exposure. This is a question that will bear some discussion, and we should be glad to hear from our readers.—ED.]

STRONG VERSUS MEDIUM COLONIES AT THE OPENING OF THE HARVEST.

How a Colony May Reach Maturity too Early for the Harvest, and thus Develop the Loafing and Swarming Mania; the Double-story Ten-frame Hive for the Prevention of Swarming, and the Busy Man who hasn't the Time to Equalize Brood.

BY E. D. TOWNSEND.

[“The ideal colony must not be over-populous. A hive is over-populous when its working force is too great in comparison to the dimension of the hive and to the number of wax-building bees.

“Such a condition is intolerable to the bees, and they try to help themselves by loafing. Their instinct teaches them to begin this loafing even before the hive is over-populous. The bees seem to see the combs are filled and capped, that the bees are daily hatching, and that they will soon be crowded. A colony in such a condition will never perform the wonders in gathering honey that we may expect from one less populous. Such a colony feels instinctively that its abode will soon be too small, and the swarming fever sets in; and we know that, when this is awakened, the bees will continue to loaf.

At the most, only as much honey will be gathered as is needed for making the swarming preparations. A colony with the swarming fever is of little value as a honey-gatherer.”—GRAVENHORST.]

It is rarely that one finds so much in so few words as is expressed in the above quotation. The thought comes in here, that there is a condition involved that is hard for the average bee-keeper to comprehend—that is, if a colony of bees comes to its best or full working strength just two or three days before the honey-flow is on, that swarm is very likely not to store more than one-half as much surplus as one that comes to maturity just with the flow. This, of course, is with the supposition that neither one should cast a swarm.

The other, or medium-sized colony, may not have wintered quite as well as the other, but had a good queen that kept what workers there were in the colony just hustling to take care of what eggs she supplied, coupled with all the other work of the hive, so that there was not a single minute but that every bee in the hive had all it could do, and many times more. Such a colony is ready for the harvest when the season does open up.

Let us look inside of the other hive—the one that was ready before the harvest was on. They have come to maturity a few days too early for the season. Although they may not have any queen-cells started during this time, if you look down between the combs you will find little clusters of bees hanging together; and if the weather is warm, perhaps some may be seen crowding out at the entrance. These bees that have clustered in this hive have learned the art of shirking, and there is nothing to do but let them swarm, because that alone will bring back that energy and hustle they had before coming to this stage of stagnation that I have explained above.

The case cited above is, perhaps, an extreme one; but I assure you that bees do not have to come to this stage of development to be worth only half a colony from a surplus-honey view-point.

Some take brood from the strong to build up the weak, doing this previous to the honey-flow, with the express purpose of preventing this stagnation on the part of the strong, and at the same time building up the weak. Such procedure, if practiced in an intelligent manner, so that the weak and the strong shall be equalized, will produce good results, because none will be too strong too soon. When this is properly done they will all work with the energy of a newly hived swarm; then if there are still left more weak colonies than can be built up into colonies in time to take advantage of the honey-flow, such colonies can be allowed to build up into colonies of their own will, or they can be used in an almost unlimited number of ways at the option of the apiarist.

The shifting of brood by the inexperienced, for any reason whatever, should be done on a small scale, and for experimental purposes only.

Since I have been in the business more extensively, a different system of management has been found necessary; namely, a scheme for using double-story ten-frame hives. A system that is all right, and which works well with one home yard of bees, may not work at all with an outyard or with extensive bee-keeping where more bees are kept than the apiarist himself can care for, necessitating the work being done by others, and these, many times, perhaps of small experience.

It is a fact that a very large hive containing an amount of honey in excess of that needed to carry the colony through spring, with an abundance of comb room, will not swarm nor acquire the swarming fever until the honey season is on, when the bees, assisted by the queen, get the hive nearly full of brood and honey.

A ten-frame Langstroth hive, two stories high, is ample in size to hold back the swarming fever until the white-honey season is on in June. Colonies in such a hive, that are good to strong, during the period of warm weather previous to the honey-flow, usually commence to store honey in this location about May 20. With so much clustering room, such as these hives afford, no swarming fever will be induced.

When the warm weather of the last part of May arrives, an upper story is given our medium to strong colonies, either with or without a queen-excluder, depending on whether it is a yard where excluders are used or not. Our honey season usually commences during the second or third week of June, in this location. As there is no honey-flow previous to the main clover flow in June, sufficient to cause bees to contract the swarming fever, the ten-frame hive used two-story during practically all of the hot weather previous to the honey-flow, keeps our bees practically free from the swarming fever, and without handling a single brood-comb.

This system is well adapted to the eight-frame hive or smaller hives, only the second story should be of worker comb, and the queen allowed full sway through both stories. Later on, after the bees get to work in dead earnest, if one likes, the queen can be put down into the lower story, and an excluder placed on the lower story, since the bees have now almost forgotten there is such a thing as swarming, being so intent on the securing of the abundance of honey that ought to be coming at this time. Moreover, with the Italian bee this is the season of the year, or the season has now shaped itself so that one eight-frame story is all (and usually more than) the queen will occupy with brood, because the bees are so intent on storing honey.

This same principle of giving abundance of comb room during hot weather, previous to the main honey-flow, with the idea of preventing the bees from thinking about swarming, is carried out with our comb-honey as well as with our extracting colonies.

In the case of the comb-honey bees, any empty brood-nests are used for the purpose

of this extra room. Then we have provided about half as many sets of shallow extracting-combs as we have colonies of bees in the yard, which are used to finish up the season in the production of comb honey, and also to give clustering room previous to the season, as I have explained above.

Remus, Mich.

SPRING MANAGEMENT.

Building Up Colonies for the Honey-flow; a Unique Scheme of Exchanging Brood between Weak and Strong Colonies.

BY OREL L. HERSHISER.

Continued from last issue.

The queen in each colony of class three will soon fill as many combs with eggs as the colony can incubate, and her usefulness in bee production for work in the rapidly approaching harvest will be curtailed unless provision is promptly made for her. We will, therefore, remove two combs of eggs from each of the colonies of class three which is sufficient to give one each to all those in class two in exchange for as many empty combs which are used to fill up the empty spaces in the hives of class three from which the combs of eggs have been removed. A few days thereafter the colonies of class two may again be reënforced by a second installment of eggs from the colonies of class three in exchange for empty combs. By this time practically all the brood that was in the combs at the time they were taken from the colonies of class one and given to class three will have emerged, and the additional nurse-bees thus afforded, together with the more favorable weather conditions that usually obtain with the advancing season, will enable the colonies of class three to nurture the young and incubate the eggs as fast as the queen can produce them; and we have so strengthened all the colonies of class two by the reënforcements of eggs from the twenty-five weak colonies as to bring them up to prime condition in good time for the honey harvest. If any of them should be still lacking they may be at once strengthened by the addition of combs of capped or hatching brood (not eggs) from the colonies of class three just before the honey-flow commences, class three having a goodly supply of such combs by reason of having kept those first given them from the strong colonies filled with brood.

Having thus brought all the colonies of class two up to the honey-flow in prime condition, let us see what may be done in order to realize some further profit from the colonies of class three. It is a fact that many bee-keepers might profitably recognize, that one strong colony that will yield a good surplus is better and more valuable, so far as honey production is concerned, than a large number of weak colonies that yield nothing. What, then, is the use of these twenty-five weak colonies from which we have been continuously and systematically taking most of

the eggs the queen could produce, but which, notwithstanding, have gradually attained a strength of from two to four combs of eggs and brood each? None of them are strong enough for the honey-flow now almost at hand, yet in the aggregate there are enough bees about to emerge, which, together with those already on the wing, would still make considerable profits in honey if they were properly assembled. Let us select eight of the best of them and use the entire brood force of the remaining seventeen in bringing the eight up to surplus-producers. We have now brought fifty-eight of the original non-surplus-honey producers up to the harvest in the best possible condition by having availed ourselves of almost the maximum egg-producing capacity of all our queens.

We have, undoubtedly, defeated swarming in a number of the original strong colonies, but have probably induced it in a corresponding number of the best of the colonies in class two, and we may assume that the increase by swarms, either natural or forced, as a result of these manipulations, has been neither increased nor decreased. Having greatly weakened the last seventeen of the colonies of class three we will hive swarms with them, selecting the best queen as between the swarm and the colony. By so using seventeen of our twenty-five swarms we shall get all our remaining colonies of the third class so strong as to gather an abundance of stores for winter, as will also the other eight swarms placed in empty hives. In the good season assumed, the twenty-five original strong colonies and the fifty-eight that have been made strong by manipulations, eighty-three in all, will gather 100 lbs. surplus each, or a total of 8300 lbs. Some of the swarms will produce surplus honey; but as the amount of surplus from the parent colony has been decreased by reason of this swarming during the main honey-flow it is fair to assume that the honey gained from the swarms is equivalent to that lost by the parent colonies, and that all have enough honey in the brood-chamber for winter by the end of the harvest.

Assume this apiary in the early spring, and the season and location to have been on an equality with the ones in the first illustration. The first apiary having produced 2500 lbs., and an increase of 8 colonies, or 108 colonies fall count, and the second, by systematic manipulation, we have brought to yield 8300 lbs. and an increase of 8 colonies, or 108 colonies fall count; then the total net gain as the reward for our pains in building up the colonies for the honey-flow is 5800 lbs. Surely that is liberal compensation.

The above illustrations are assumed in order to illustrate clearly the possibilities of careful and systematic manipulations, conducted with thoughtful care and with a definite object in view. It may be unnecessary to state that rarely if ever will the exact number or the proportion of strong, medium, and weak colonies, assumed in these illustrations, fall within the experience of the bee-keeper. It is hoped, however, that the

assumed examples will serve to emphasize the golden rule of apiculture, namely, *supply to all the queens the conditions necessary for reproduction to their fullest capacity during the time that will bring the workers to the honey harvest at the most vigorous age.*

Commenting on an outline of this plan of building up weak colonies, heretofore published, J. L. Byer, writing in *Canadian Bee Journal*, remarks that this has always appeared to him to be too much of the robbing-Peter-to-pay-Paul nature, and he doubts if so much time spent in manipulation is paid for in the end. His comparison is at fault, for both Peter and Paul (the colonies of bees) are the property of the bee-keeper, and there can be no robbery in making an advantageous disposition of one's own property. I suggest a better comparison. The apiarist, being possessed of certain talents (his colonies of bees), is justified by a high sense of duty to himself and to all in making such disposition of them as will yield him the greatest profit. If he has a colony containing a choice queen which he contemplates moving from an outyard to his home for breeding purposes, but, upon making a trip for the purpose, finds she has absconded with a large swarm, Peter has been robbed, but Paul has not been paid; and the bee-keeper who has not made the best use of his talent has suffered a loss. Far better to have done a little manipulating to build up some weaker colony with brood that could be spared without impairing the usefulness of the strong, and, incidentally, retard or defeat swarming.

The expedient of stimulative feeding may be very profitably employed after settled warm weather has commenced whenever there is a protracted honey-dearth, and especially after apple bloom, until white clover begins to yield nectar, ever urging the queen to keep everlastingly at it during this interim, for it is the bees reared at this time that will be of the greatest service a little later on. Very often the colonies that are strongest in the early spring are surpassed in honey-gathering by those of medium strength, which is probably due to the latter having a field force of workers of greater vigor, many of the former having reached the period of old age before the harvest is on.

Frequently bees winter with very light loss of stores, and in the spring the brood-chamber is clogged with honey to such an extent as to restrain the queen seriously at the time when she should be laying to her full capacity. In all such cases combs of honey should be removed and empty ones given in exchange, so the building-up of the colony may not be retarded. These combs of honey may be profitably used in outside stimulative feeding during any dearth of honey after apple-bloom, placing them some rods from the apiary for the bees to empty. However, if foul brood is in the locality, outside feeding of honey taken promiscuously from the hives should not be resorted to without caution.

Spreading brood is an expedient which,

on the whole, requires such careful judgment that it can not be recommended. Early in the spring it certainly is not advantageous, and later it is hardly necessary, as the bees and queen will attend to all that without assistance. But if it is felt that the brood must be spread, do it by placing the outside comb, in which the queen is laying, in the center of the brood-nest, making a place for it by moving the combs apart. This will not materially enlarge the brood-nest; and the fact that the queen is occupying this outside comb is some evidence that the colony can maintain the proper temperature over that portion of the brood-chamber.

Well-thought-out plans, systematically and practically applied, will often win success from what may seem hopelessly adverse conditions. Liberal reward by way of increased profits surely awaits the bee-keeper who gives systematic thought to his bees in the spring, and anticipates the honey-flow with thorough preparation of his colonies.

Buffalo, N. Y.

FEEDING FOR STIMULATING.

Spring Feeding to Stimulate Brood-rearing Wrong in Theory and Practice; Feeding in the Fall the Proper Time; Requeening More Important than Either; Ripening Honey on the Hives.

BY J. E. HAND.

I have read with considerable interest Mr. Alexander's article on spring feeding, page 1376, Nov. 1, 1907, especially since I have expressed somewhat opposite views upon this same subject, even going so far as to say that *spring tinkering with bees is a useless waste of time*, and that, if it is necessary to feed in order to stimulate brood-rearing in the spring, autumn is the time to do it instead of spring. I use the word "if" in the above connection because recent developments have led me to conclude that *feeding at any time to stimulate brood-rearing is unprofitable*, and is beginning at the wrong end of the problem to solve it.

If I had a queen that would not lay all the eggs that a colony of bees could care for during the breeding season I would reinforce her by adding another queen; and I consider this the proper thing to do instead of feeding all summer to try to force one queen to do the work that two could do without any fussing whatever.

On page 1318 Mr. Alexander says: "I can see no more consistency in feeding bees during September in order to induce spring brood-rearing than there would be in feeding our cows in July to increase the flow of milk the following May."

Mr. Alexander could not have hit upon a happier illustration than the cow, since these two cases are almost exactly parallel, only, in my mind, the application works just the other way. It is just as important to feed a cow during winter with a view to increasing

her flow of milk the following season as it is to feed bees during September to stimulate brood-rearing in the spring.

In the case of the bees, the surplus energy (the result of stimulative feeding during September) is stored up within the hive for future use in the form of a greatly increased force of young bees which, after all, is the greatest stimulant that can be imagined to induce early and constant brood-rearing the coming spring, and without which spring feeding would be in vain, since no feeding would be necessary to enable a queen to lay all the eggs a *weak* colony would care for.

With the cow, the surplus energy (the result of high feeding during the previous season) is stored up in the form of flesh and greatly increased vital force, all of which will enable her to turn a greater part of her food during the following season toward increasing her flow of milk instead of to the building-up of a body weakened by improper care and insufficient food during the past season. And such a cow will not have to be helped up in the spring any more than will such a colony of bees need feeding in the spring to stimulate brood-rearing.

I wish to go on record as saying that if bee keepers would give their bees proper care and attention during the latter part of the season they would require very little attention during the following spring until time to put on the sections, and weak colonies would be the exception instead of the rule.

Now I think I have made it quite clear that autumn feeding is ahead of spring feeding; yet there is something else of vastly more importance than either, and that is *the queen*. When it becomes necessary for the bee-keeper to feed his bees to stimulate brood-rearing during the *natural breeding season* you may depend upon it there is something radically wrong with his management. The queen is probably worthless, and she should be replaced by a good one reared on correct and scientific principles.

There are two points in Mr. Alexander's article that he does not make quite clear. One is, why he finds it necessary to have so much honey in his hives during winter as to interfere with the brood-nest the following spring; and the other is, why does the uncapping of sealed combs, if properly done, induce robbing any more than feeding would?

THE SUPREME IMPORTANCE OF HAVING HONEY WELL RIPENED.

Regarding the statement that it is not necessary to have more than one set of extracting-combs on a colony at a time, I can, perhaps, better express my views by quoting R. A. Burnett & Co.'s statement to the effect that, *if bee-keepers would allow their honey to ripen upon the hives it would do more toward creating a demand for it than any law against adulteration*. And I will add to this that, if every bee-keeper in the country would read this until he can repeat it with his eyes shut, and then put music to it, and learn to sing it and whistle it, and then paste it all over his hives, extracted honey would soon

sell for very nearly as much as comb, and it would be better worth the price than it is today.

Birmingham, O.

[Our correspondent has made some very good points, some of which we have taken the liberty of italicising in order that the reader may be sure to see them.

We can only repeat, as we have already done, that in considering the Alexander methods we must take into consideration his peculiar environments, and the fact that his main honey-flow begins some weeks after the honey-flow of most bee-keepers in the Northern States comes on.—ED.]

WOODEN SPLINTS VERSUS WIRES IN FRAMES.

The Comparative Advantages of Each.

BY DR. C. C. MILLER.

A correspondent asks me to reply in GLEANINGS to some questions about foundation-splints. These questions are mainly answered in a slip that The A. I. Root Co. sends out with the splints; but in view of an awakening interest in foundation-splints it may be well for me not only to answer them here but to discuss the whole subject quite fully.

I do not think of any advantages that wiring has over splints, and I do know of advantages that the splints have over wiring. With horizontal wiring there is testimony to stretching of the foundation. Although this testimony is pretty general, there are probably thousands of bee-keepers who have never suspected any evil results from horizontal wiring, and yet the evil results are there all the same. Sometimes the stretching is enough so that drone brood will be found in several rows of cells under the top-bar. Of course, this will be noticed; but oftener the stretching, while not enough to allow the cells to be used for drone brood, is enough to prevent them from being used for worker brood.

I remember one very good authority saying that, with the Langstroth frame, there would always be something like two inches of honey between the brood and the top-bar. This is probably quite generally true, because horizontal wiring is in general use, and the cells for some distance under the top-bars are so stretched that the queen will not use them. But with perfect worker-cells under top-bars there will be no such margin of honey. In the height of the queen's laying I'll show you frame after frame with the brood clear up to the top-bar—not a cell of honey between brood and top-bar. Later on in the season, as the honey encroaches on the brood-nest it will encroach at top as well as sides.

Is there any need to discuss horizontal wiring further, so long as splints give perfect worker-cells clear to the top-bar?

But what about vertical wiring? I've had

hundreds of frames wired vertically, and the cells under the top-bar were faultless. But in order to have the wires sufficiently taut to be straight, the stretching bowed the bottom-bars. This, while in reality changing the depth of the frame, made it practically impossible to bring the foundation clear down to the bottom-bars unless the foundation were cut curving—a difficult thing to do, seeing no two curves were alike. Vertical wiring might do all right with bottom-bars $\frac{1}{4}$ thick, but that is hardly desirable.

I have not mentioned all the objections to wiring, but is it necessary? Better tell about splints.

Foundation-splints are made of basswood—for any thing I know, other wood would do—about $\frac{1}{16}$ of an inch square, and about $\frac{1}{8}$ inch shorter than the distance between top and bottom bars. They might be made long enough to touch at both top and bottom, but that would make slow work about putting in. For each frame of usual length, five splints are used, placed vertically.

Take a shallow dish—a square pie-tin is good; put in it enough beeswax so that, when melted, it will be $\frac{1}{2}$ inch or so deep. Put in enough splints so the dish will not be too crowded, and it will froth up by means of the steam from the moisture in the wood. When it stops frothing you are ready to operate. The heat should be properly graduated, either on a kerosene, gasoline, or some other stove, so that the wax shall not be kept too hot, otherwise not enough wax will cling to the splint to coat it. If too cold it will not be easily cemented to the foundation. So long as the wax is kept liquid it is not likely to be too cold. The work should be done on a hot day or else in a hot room, so the foundation will be soft.

Wiring is done before the foundation is put in the frame. Splinting, on the contrary, is done the last thing, the foundation being fastened in whatever way to the top-bar, and being cut large enough to fit close to the bottom-bar and end-bars. It is a little better to have a divided bottom-bar, as in the Miller frame, so the foundation shall go down between the two parts of the bottom-bar; but with a plain bottom-bar the foundation merely comes down to the bar.

Take a board that will fit easily inside the frame, perhaps $\frac{1}{8}$ inch smaller than the inside dimensions, and put stops on the edges so the foundation shall just rest on the board. It will make the work a little easier if you have on the board a mark where each splint is to go, a straight black line heavy enough to show through the foundation. There is to be a splint an inch or so from each end, a splint in the middle, and a splint midway between the center and each end splint.

With a small pair of nippers having square jaws, pick up a splint by the center out of the hot wax and lay it in place. It doesn't matter whether it touches the top-bar or the bottom-bar, or whether it is part way between. Don't fret if you don't lay it within an inch of the right place. In the hot room it isn't going to cool right away, and you can

shove it into place with the end of your nippers. But after a little practice you'll drop it in the right place first time, and do it very rapidly. As soon as you put it in place, an assistant presses it slightly into the foundation with the edge of a thin board kept constantly wet. That's all; the bees will do the rest.

By the aid of these splints I can show you beautiful combs built clear down to the bottom-bars—not a pop-hole anywhere. But I can show you lots in which the bees have more or less gnawed away the foundation so as to make passage between the comb and bottom-bar. That's because the frames were given when they ought not to have been given—in a poor year when bees were doing little or nothing. If you want combs built down to the bottom, get them built and finished at a time when the bees are storing.

"Do the splints interfere with the laying of the queen?" Not in the least. When the brood is sealed, with the comb in the right light you can see a slight ridge where the splint is, but it can do no possible harm.

I think that is all; but if any one has further questions I'll be glad to answer them.

The same correspondent asks, "What is your plan for controlling increase in producing extracted honey?" I work altogether for comb honey. But if I tried for extracted I'd have large hives with abundant ventilation at each story. With room enough and ventilation enough I should expect swarming to be pretty well-controlled. I might also try the Demaree plan: Just before swarming time raise all brood into an upper story over an excluder, leaving the queen in the lower story with empty combs or foundation.

Marengo, Ill.

[It is said that "confession is good for the soul." We are frank to acknowledge that we did not take kindly to Dr. Miller's wooden splints when he first wrote about them some years ago; but in view of the complaints of a slight sagging due to horizontal wiring, resulting in the building of drone-cells at the top of the comb, and in view of the further fact that vertical wiring with thick top-bars is not practicable, we are now inclined to look with favor on the Miller wooden splints. Dr. Miller has improved his method of applying them, and the difficulty of manufacturing them in the first place has been largely overcome, so that now the two main objections which we originally offered have disappeared. The wooden splints are cheap, and easily applied, if we may judge from the description given by Dr. Miller. We have seen a good many of Dr. Miller's combs stayed as he recommends; and a finer lot, filled clear out to the wood, without pop-holes or drone cells, can not be found in this country.

The very argument that Dr. Miller presents in favor of foundation cut to fit brood-frames applies with equal force to foundation cut to fit sections. Why? If a neatly fitting sheet prevents pop-holes and passageways in the one case, why should they not

in the other? G. J. Yoder, in this issue, explains how in the ordinary section one can fasten foundation and cut it to fit so it will not buckle. If there is any thing in this scheme, or in that of Mr. J. E. Hand, it goes without saying that by either plan we shall be able to secure a much larger percentage of No 1 and fancy comb honey. When we remember that the fancy always sells at a good price, and that a really fine article of No. 1 follows next, it is apparent that foundation making contact with all sides of a section probably means dollars and dollars to the bee-keeper, with practically no extra cost in foundation, and with perhaps a little extra time.—Ed.]

PRESERVING HIVES.

How and When to Paint; What Paint to Use; Metal and Paper Covers.

BY F. GREINER.

To justify us in saying very much about painting hives it must be conceded that covering a hive with paint does no injury to the bees within it, and that, at the same time, it is a paying investment. The latter question, I believe, we could as well dismiss without argument. With the price of lumber as it was 35 years ago there might have been reason for not painting hives and houses, for it was cheaper to replace than to keep constantly painting; providing we cared nothing for looks; but with lumber at from \$30 to \$45 per 1000 we can well afford to keep hives and houses painted.

As to the first question, I have come to the conclusion that bees do not suffer in painted hives any more than in unpainted ones. I have watched the cellar-wintered bees in the unpainted hives and in those painted; and with the amount of ventilation they have in my rather dry cellar the combs and bees come out as dry and as well otherwise in one as in the other. As I have settled on wintering outdoors with upward ventilation through a thick packing, there is never an excess of moisture nor an uncomfortable condition on this account in my hives, painted or not painted. So far as I am concerned I want to keep my hives painted, and I believe a large majority of bee-keepers concur with my conclusion.

The larger part of my work along this line has been repainting, rather than painting new work, and I will more explicitly deal with this in my article.

As to the color, a light one is to be preferred. Dark draws the heat to an undesirable degree, although with chaff hives the difference is not so marked. A very smooth glossy surface is not to the liking of the bee, perhaps in more than one way. For this reason I never give more than two coats of paint to new work—the first a very thin coat, the next a rather heavy one. I also practice covering the fresh newly applied paint with fine sand or cement, particularly the front of each hive, and slanting alighting-boards

if the latter are painted at all. A rough surface enables the bees to get a better foothold, saves bees and bee time, and the bee is not dazzled by a white glaring paint (the last is only theory).

As to what kind of paint to use, this is a perplexing question to answer, as we have difficulty in obtaining the same grade of paint each time. I have used white lead and raw oil with a very little japan drier added, and it wore very well. At other times it either scaled off or rubbed off as dust (I should prefer a paint which had the last-named fault rather than the first, as it would last very much longer). The trouble seems to be either in the oil or in the lead. Perhaps adulterants have been used at times with one or the other. An addition of zinc is an improvement on the paint; still, I use it very seldom, and only in the ready-mixed paints. I have never used the dry-powder (water) paints on account of lack of faith; but I should like to hear from some who have used it for hive-painting, or any other work, as to its protecting power, lasting qualities, etc.

HIVES CAN BE PAINTED WITH BEES IN.

In repainting old work I do not wish to go to the trouble of taking the bees out of their hives. When hives needing paint become unoccupied, then, of course, is a good time to repaint them; but this does not occur often, and generally we do not wish it to; consequently the most of my repainting is done with the bees in the hives. A good time is when we are not very busy with other work, either early in spring or in the fall of the year. As much of the old loose paint, propolis, wasp-nests, spiderwebs, etc., as possible should at first be removed. For this purpose nothing is better fitted than a cabinet-maker's steel, which also answers for cleaning separators and the insides of our supers and hives. A worn-out crosscut saw will make a good many such "steels." I have cut a number of them about 3×6 inches, filed straight and perfectly square. They come very handy in the shop and yard. We can dig with them into the corners, and scrape off all the loose paint and accumulations very quickly. It is necessary to give the colony in the hive to be treated a little smoke, even if it should not be warm enough for bees to fly. As soon as cleaned, and surface is dry, the paint may be applied with a medium-sized flat brush. At certain seasons of the year the bees may not trouble any at the entrance. If they should, it might be well to remove the bottom-board, exchanging it for one already painted, or wait for the bees to retreat, perhaps finishing the job with a few strokes after they have become quiet, and then sprinkling a little fine sand upon the green paint. This will prevent any of the bees from becoming daubed very much. I use a little more drier when repainting in this manner than when doing up new work, for obvious reasons. The bottom-boards are giving me the most trouble to preserve, and constitute nearly all there is about a hive to give out.

I am anxious to find a preservative not obnoxious to the bees; and, by the way, I want the bottom-boards of hives made of fully as heavy lumber as any other part. I could give quite a number of reasons for this.

The paint on the roofs gives out the quickest, and needs replacing frequently, unless, indeed, metal is used, which needs no paint whatever. No metal answers the purpose better than zinc. Next would be zinc-coated iron (galvanized). I am confident that such metal roofs are the cheapest for bee-hives, in the long run. On account of the temporary cheapness I have used roofing-paper, tarred and otherwise. The Neponset has given me the best service. By giving two coats of oil they have lasted ten years and are good now. Perhaps they should be painted. The weak feature is that paper roofs do not stand rough usage. In carting them about, the paper sometimes is torn. They must be handled with care.

A point about covering wood covers with paper or metal is this: "Cover the edges of the boards as well, and do it thoroughly, or water will be driven in and under the covering, which will soon rot out the wooden portion of the cover, thus causing a loss and lots of trouble. I have used different kinds of paints on the flat wooden roofs; but all will give out in two or three years. Sanding has not proved to be any help, as I had hoped. If we keep any part of the hive painted it certainly should be the roof, and white is to be preferred, particularly if only a single thickness of lumber is between the bees and the outside. I can hardly understand why others have no trouble with such an arrangement. I have, only a few times, left some hives uncovered by accident or oversight, this happening when the sun shone upon the hives during the noon hour. The result was the loss of a super of honey, not counting the injury to the bees in each and every case. One thickness of board (these spoken of were unpainted) is not enough protection against the hot rays of the sun; but if that is all the protection given, perhaps the white paint would lessen the effect.

I should have mentioned the advantage of repainting hives when no bees are in them; viz., that we can then drive a few nails where needed. Boards will check and warp some, particularly with my hives, which are only nailed together—no lock corners, no halving—just butted together. These hives stand the wear well, but need a few nails occasionally. It must, however, be said that only those of recent make are put together with cement-coated nails. Formerly only the smooth nails were procurable, and finish nails, either wire or cut, were used.

My supers, which are housed when not in use, will never again need paint, or nails either, so it would seem, although many have seen thirty years' use.

In regard to paint-brushes, I want to add, be careful how you leave them. Keep them in oil "suspended," not standing on the bristles. Just keeping them in water will do; but the make of brushes we have now

will rust out in a little while if thus kept. Oil prevents it and does not evaporate.

Naples, N. Y.

[We desire to indorse in the main the statement made by our correspondent, especially when he says he prefers a paint that will powder or chalk rather than one that will scale off from the wood. A pure lead, after it has been on for two or more years, is liable to powder, while a lead-zinc paint will scale. In most localities a pure white lead will give better results than one containing a percentage of zinc. The majority of the ready-mixed paints contain some zinc. The purpose of the latter is not to adulterate or cheapen, but to give a harder and glossier finish; but in localities subject to a hot burning sun in summer preceded by a large amount of humidity, the zinc paints should be avoided. While they give a hard surface, that very hardness causes the paint to flake off in scales; then when the wood is repainted it has a smallpox appearance. But that is not all. The paint that did not flake off will, after the repainting, sooner or later come off, taking with it the top coat. On the other hand, if a pure lead paint be used, when the surface becomes old it will chalk off, or powder; but on a fresh application of another lead coat this powder will unite with the oil, serving to strengthen the paint, making the surface smooth, and as good as it was on the first coat.

The first coat of any paint should be put on very thin, as Mr. Greiner recommends. The surface of the wood should be dry and clean; the second coat should be put on thicker, of course. In buying lead paints, make the seller put up a guarantee to refund the pay if the paint flakes off in scales at the end of three or four years. Another thing, do not try to buy a cheap lead. The national pure-food law does not apply to any thing but food and drugs, and the dealer may sell you adulterated paints without fear of prosecution, hence make him put up a guarantee.

As Mr. Greiner states, we have painted hives while the bees were in them. The alighting-boards are usually painted at night. The paint will set enough before morning to cause no inconvenience on the part of the bees.

This article is seasonable, because in the spring, when it is too chilly to do other work in the apiary, one can paint all his hives — both occupied and unoccupied.

We agree with our correspondent that it is economy to use paint; for the high price of lumber, which is constantly going up, makes it more necessary than ever to preserve it. Then if any one wishes to sell any colonies, or his whole yard, nice bright painted stock will bring a far better price than that which is unpainted.

Paint made of Portland cement and oil has been suggested several times in our columns. See p. 230, Feb. 15, 1906; also p. 715, May 15, 1907. From tests that we have made, we have concluded that such preparations are worth investigating.—ED.]



We acknowledge the receipt of an excellent annual report of work done at the agricultural experiment station on the island of Tortola, one of the Virgin Isles, West Indies. It contains some excellent views of the island, and is well gotten up. Tortola is excellent for bee-keeping, and has the reputation of being very healthy. It is easily reached via St. Thomas, Danish West Indies. The price of this report is six cents.

A NEW WORK ON BEE HISTORY.

We have received a small book containing a brilliant contribution to the history of bees and bee-keeping from the earliest days down to the present time by the editor of *Pfälzer Bienenzzeitung*. Mr. Ph. Reidenbach. This was originally given at the golden jubilee celebration of the Pfälzer Bee-keepers' Association last summer. The author shows a very comprehensive grasp of the whole history of bee-keeping, in addition to which he wields a facile pen. The brochure is adorned with portraits of Georg Pictorius (1041 A. D.), Freiherr von Ehrenfels, Mehring, Dzierzon, Berlepsch, and Leuchart. The work comprises only 44 pages; but the author has managed to compress within the space allotted to him a mass of valuable information which required much research to discover. Copies may be obtained from the office of the above journal at Rehborn (Pfälz), Germany. The price is one mark.

A SWISS APIARY.

On the next page the reader's attention is directed to the characteristic view of an apiary in Switzerland, a country to which all modern bee-keepers look with veneration as the classic land of bee-keeping — the home and nativity of Huber, the prince of bee-keepers. Switzerland, certainly, is a land of science. No other country is so sincere in its affection for the cause of truth. Of course, it is a small country in area and population; but in ideas it is not small, and it has given to the world a host of illustrious men. At present it is a hotbed of advanced ideas on bee-keeping, led on by such men as Kramer and Goldi; and the Swiss never seem to lack illustrious men to lead them forward. A few years ago they had Bertrand and Dr. von Planta. It would be a grand thing if feverish America would catch on and hold fast to the scientific spirit which characterizes the Swiss people in all their actions.



SWISS BEE-STATION AT DAVOS.



MEMBERS OF THE MICHIGAN STATE BEE-KEEPERS CONVENTION, HELD AT SAGINAW, DEC. 18 TO 20, 1907.

The report of this convention appeared on page 99 of the Jan. 15th issue.

BEE-KEEPING IN GEORGIA.

Colonies on Elevated Platforms.

BY J. L. PATTERSON.

I keep my apiary on elevated platforms as shown in the engraving. The hives do not rot so fast, and frogs, ants, spiders, etc., can not get into them. The bees are also

more easily kept out of water or away from the sand, which often beats against the hives with the wind.

Last year I averaged 30 lbs. of honey to the hive; but this year I did not do so well, for there was an average of only 10 lbs. to the hive. Two of the extracting-hives contained $2\frac{1}{2}$ gallons of honey each. In a poor season the very strongest colonies store their



J. L. PATTERSON'S ELEVATED APIARY, AT AUGUSTA GA.

hives full of honey while the weaker ones live on through the season without storing extra honey.

There were only two days last season when the bees did not fly out of their hives. It was a warm winter.

Augusta, Ga.

BEE-KEEPING IN BRITISH GUIANA.

BY W. K. MORRISON.

The picture here of an apiary in the city of Georgetown, British Guiana, is almost self-explanatory. The hives are raised on stilts to prevent the very large frogs from

which are as large as a buggy-wheel. These rest on the water, and are beautifully green. The flowers are at night like stars on the surface of the canals. Mangrove swamps near by help the bee-keepers to make both ends meet; but there are many other flowers, such as cocoanut, royal palm, poinciana, etc. Though low and swampy, the city is not unhealthy; but it possesses one of the largest hospitals in the world.

When the writer saw this apiary it was on a roof over a grocery and provision store, but it was rather too hot for the comfort of the bees or the owner. I think the owner, Mr. Faraz, is a native of the island of Madeira, a beautiful tropic land off the coast of Africa, ruled by the crown of Portugal.



ANTONIO FARAZ IN HIS APIARY IN SOUTH AMERICA.

leaping up to the entrance and devouring all the bees. If the reader thinks this is an imaginary evil he is mistaken, for I cut one open which had been at a hive for some time; and, so far as I could judge by counting the bee-heads in its stomach, it had just consumed 400 bees.

The city of Georgetown is intersected with canals, and these make splendid breeding-grounds for the frogs. Despite this fact, the city is a hot-bed of bee-keepers, and for its size I should say it had more bees than any other city in the world. The bee-keepers, however, get fair results; but during the rainy season they are obliged to feed liberally to save their bees.

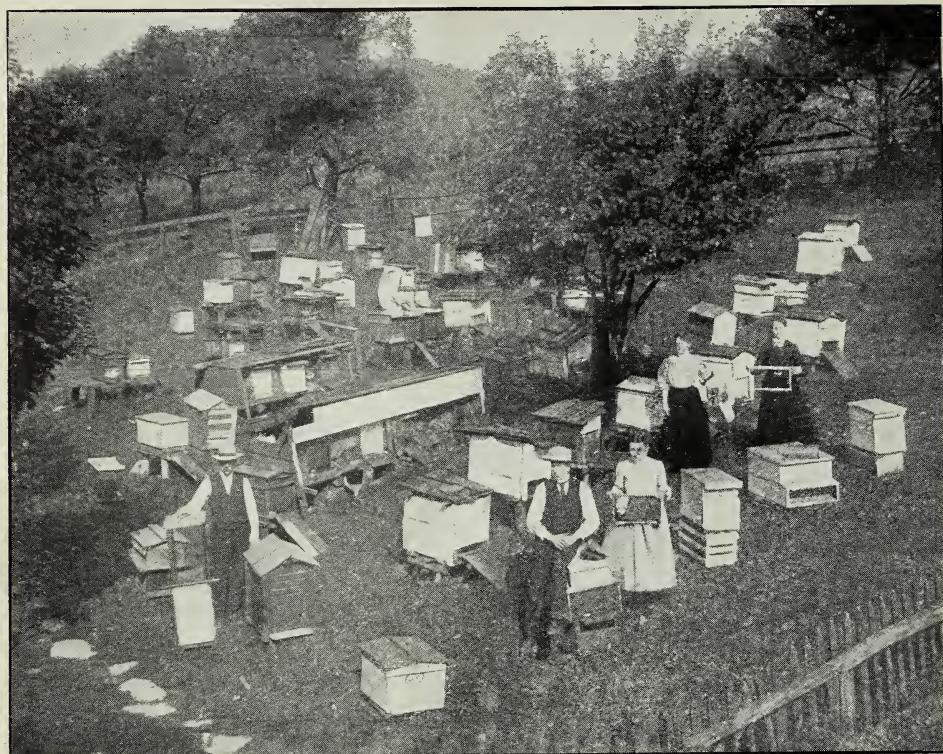
One of their honey-plants is the wonderful water-lily—the *Victoria Regia*, the leaves of

THE BREEDING OF QUEENS.

Is the Time of the Year and the Manner in which a Queen is Reared of more Importance than her Pedigree?

BY J. A. CRANE.

I have watched with much interest the tilts between Dr. Miller and the editor of GLEANINGS with reference to the advisability of breeding from pure stock as the best honey-gatherers irrespective of race or color. I have been experimenting along the same line for several years, and my conclusion is I would rather have a carefully reared queen from my poorest stock than a poor or ordinary one reared from the best stock in the country. I would also rather have a queen



S. E. KLEIN'S APIARY, INDIANA, PA.—SEE NEXT PAGE.

raised during basswood bloom than any other season except it might be a supersEDURE queen at almost any time. I also much prefer swarming-cells to any artificial kind.

I have bought but two good queens in my life, and can not say for sure that they were both good, as the bees superseded one of them the same season; but the daughter of that one, mated to a drone from the stock of the other, making a red-clover golden cross, was the best queen ever in my yard. She was the early bird every time. Her bees filled five supers of extracting-combs during apple bloom in 1906, weighing 90 lbs., and cast a large swarm, and three supers in 1907, when she would have been four years old in August; but she was missing in June, and the bees raised a new one from the brood. I have raised a few queens from her, and they are very fair; but not one of them can come up to her.

I have also a queen received as a premium in 1904 that I have relied on for my breeding-queen because of the gentleness of her bees; but in very few cases do her daughters produce extra-gentle bees; but she made a honey record the next season after I got her, and has never swarmed, and I have more than fifty of her daughters in my yard. I produce nearly all extracted honey, and her stock nearly all cap their honey greasy, so it

is readily seen they are hustlers. But my point is this: A queen raised in a full colony from the egg, without hurry, and only two or three cells allowed, and raised during basswood, will give you something that is worth money, even if they never had a pedigree. I prefer, though, to breed from pure blood on the mother's side, and let the queens mate as may happen. The main reason why I prefer Italian to the blacks is the ease in finding queens, as I use a queen only two years unless she is extra good, and only one if she proves in any way slow.

Another reason is, I have no wax-moths or worms in my combs. Since I have had no queens except pure Italian, no matter how mated, I have never had to fumigate a comb, and can leave empty combs around very carelessly all summer, and they will not be seriously damaged. I can keep queenless colonies all summer by giving brood to keep them stocked, and the worms do not do any harm.

Alexander's method is of no use to me, because I want an early brooder to get the apple-blossom honey, while his surplus comes in August, when my bees have nothing to do but bother the berry-pickers.

If I could not get the apple-blossom honey I would not keep bees in this locality for all there is to be had the rest of the season.

This requires extra-prolific queens which get to business early in the season and lay late in fall. It does not take as many bees to get a lot of honey from apple bloom as from clover; but they seldom are in condition to build much comb, but will fill a super in a hurry in good weather.

Marion, N. Y.

[If the bees fill the cells so completely with honey that there is no air-space next to the carpings the surface of the comb will have a transparent, watery appearance, or "greasy" as you call it on the preceding page. It is often stated that some Italians have this trait; but have any data ever been collected which would show that bees which cap the honey watery are *always* hustlers? We should be glad to hear from our readers on this point.—ED.]

NINE YEARS OF SUCCESS.

Bee-keeping in Connection with Farming.

BY J. E. KLINE.

I produce comb honey, and that only. When the honey is taken off I am careful to see that the colonies are all right, with plenty of stores, and then pack ready for winter. I do not lose three per cent.

I live near a county-seat of nearly ten thousand inhabitants, and am well known to the business men of the town. By treat-

ing my customers courteously, and giving a square deal, I have steadily built up a large trade which now takes, to supply it, thousands of pounds of purest and best honey bees can produce.

At present I am on a large farm, and am giving my attention to both pursuits. I give my bees the same care that I give to the rest of the stock; but in the near future I expect to give all my time to a largely increased apriary.

Indiana, Pa.

SECTIONS PERFECTLY FILLED.

How to Put in Full Sheets of Foundation Cut to a Fit, and yet Avoid Buckling; How One Man has Worked Out the Problem.

BY G. J. YODER.

[We are reproducing, for the convenience of our readers, the cuts we published at the time Mr. Yoder described this originally in GLEANINGS for May 15, 1904.—ED.]

I was interested in the discussion in the Jan. 15th issue, p. 82, on the subject of sections and full sheets of foundation, for I think it is well for us to put forth every effort for the perfecting of this plan. If the section is never so nice, and the filling and finishing imperfect, our profits will be greatly diminished. In the first place, it is unwise to attempt to fasten a full sheet of



FIG. 1.—YODER'S PLAN OF FASTENING FULL SHEETS OF FOUNDATION ON THREE SIDES.

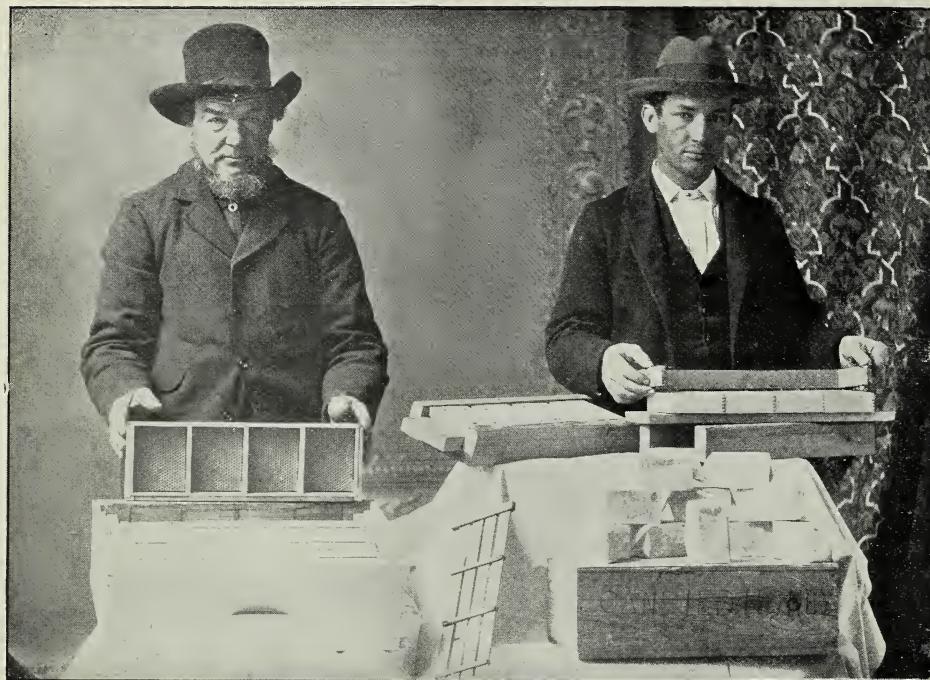


FIG. 2.—FASTENING FULL SHEETS OF FOUNDATION ON THREE SIDES.

By using this method it was found that buckling was prevented.

foundation on all sides of a section unless it is placed in such a position that it can not spring either way until it is filled and finished by the bees. This is easily accomplished by following the directions and illustrations we gave in the May 15th issue of GLEANINGS for 1904.

Cut a light board about three inches longer than the width of four sections, and just the width of the inside of the section. Now cut four square blocks of such a size that folded sections can slip over them, and a fraction less in thickness than the width of the section. Nail the first block $1\frac{1}{2}$ inches from the end of the board, and place a section over it. Put block No. 2, with section over it, next to No. 1, and so on till all are nailed on. Make at least five or six of these forms with blocks on. Next make a trough the width of the board of the form without the sections, and 2 inches deep, so the form will slip in easily to the depth of the blocks. I next melt some wax for fastening the foundation, using about one-tenth part of clean rosin, and have ready a wax-fube or teaspoon with the end bent in on both sides.

If possible, get the foundation cut by the manufacturer, so that all sheets will make a given number of uniform starters with as little waste as possible. The three last seasons I have been unable to buy starters cut just right, and so have had a loss of one-

seventh of the foundation for the crop of 20,000 sections.

Put the sections on a form, and spring the section-holder over them. This makes them square and tight. Place the foundation in clear to the top of the section. I prefer a $\frac{1}{8}$ space between the lower end of the foundation and the bottom of the section, as this is just about the amount needed to take up any possible sagging, and to prevent the buckling of the foundation. Now grasp the form in such a way that the top part of the section is lowest, and apply the melted wax on the section at the edge of the foundation, turning the form so as to run the wax all around as far as wanted. If all four sides are waxed, the weather warm, and the honey coming in fast, there may be a bulge at the lower part of the section; so of late we prefer to cut the starter full size, $\frac{1}{8}$ inch short at the bottom, and to wax the top and only two-thirds down each side. Lay this filled form down to cool, and take the next, giving the wax of the first four sections a few minutes' time to harden. Then place the form over the trough; press the tray down out of the sections and you will have the wide frame of sections, and with the foundation ready for the super without danger of buckling.

If every thing is made right, this method of fastening foundation is not very slow, as we have had over 3000 starters fastened in a

day by one man. Out of the crop of 12,000 sections the past season, I have had in proportion fewer imperfectly finished than ever before.

Our bees did very well the past season. From a little over 200 colonies I took 12,000 sections and 4 tons of extracted honey. I did all the work and manipulating myself, up to casting and extracting. I am 64 years young.

Meridian, Idaho, Jan. 22.

[We had quite forgotten the fact that Mr. Yoder described this same method of using sheets of foundation cut to a scant fit, nearly four years ago. Indeed, his method is similar to the one that we have been advocating of late, except that he advises fastening on only three sides, leaving the bottom untouched. We are inclined to believe that he is right.

The use of full sheets of foundation cut to a fit, will, if the buckling difficulty can be overcome, give a more nearly fancy grade of honey than where a small starter is used, or a full sheet leaving a bee-space all around it except, of course, at the top. While Dr. Miller's method of using two starters, one at the top and one at the bottom, makes a good fastening at the base, it still leaves a chance for pop-holes and bee-spaces in the comb at the sides. It occurs to us that it might be possible for us to combine the Yoder and the Miller method, using two starters both cut a scant width of the section, but so as to leave a small gap between when fastened in the sections. Of course, it goes without saying that a close-fitting sheet of foundation in a section while on the hive must be held perfectly square, leaving no chance for the foundation to buckle.—ED.]

HONEY EXHIBITS AT FAIRS.

A Successful Display at Salt Lake City.

BY F. W. REDFIELD.

At our exhibit at the State Fair in Salt Lake City this year, Sept. 30 to Oct. 5, we had 13 observation hives of bees, a large assortment of goods at each end of our space, besides a big display of honey. The picture does not do justice to the exhibit, as so little of it can be seen. The comb-honey house was lit up with electric lights, and showed off to good advantage. The decorations were in purple and gold, the same colors that we use on our labels for tins. The space occupied was 30 by 15 feet, and our display drew more people than any other on the grounds. The walk was continually packed with people admiring the honey, over \$50 worth of which was sold right there. The rest went at the close of the fair, and



HONEY EXHIBIT AT THE STATE FAIR IN SALT LAKE CITY, UTAH, SEPT. 30 TO OCT. 5.

we took orders for twice the amount on display, which we shipped down after the fair closed.

Ogden, Utah.

THE IMPROVEMENT OF THE HONEY-BEE.

Pure Races should be Selected, since the Good Points of the Crosses may Not be Perpetuated; Not Desirable to Breed for too many Points.

BY C. F. BENDER.

I have had good results from careful breeding, taking a good strain to begin with, and I see no reason why any painstaking person could not do the same. There are a few, even among the ranks of bee-keepers, who argue that there is nothing in selection, either natural or artificial—that the Creator made bees with certain instincts which can not be removed or changed. To such I have little to say, except that it does not appear that way to me.

If we are to get any great results from breeding we must decide what qualities we are to breed for. We must select one race of bees, and confine our efforts to that race alone. A first cross may sometimes be better than either race composing it; but such results are not permanent, and can be made so only by a long course of selection.

The leather-colored Italians are, I think, the best race to begin with. There are so many things to be considered in deciding among the different races that I can not give my reasons here; but after a fair trial I must give them the decided preference. They are good to begin with, but we want them better. We want them, 1. To store more honey; 2. To cap it whiter; 3. To swarm less; 4. To sting less; 5. We want to make them

more beautiful if we can. We will proceed to take up these points in the order of their relative importance.

1. *To store more honey.* A very simple matter if this quality were alone to be considered. Simply select the colony that produced the most pounds of honey, and breed queens from that alone. Select three or four of the best colonies for producing drones, and allow no other drones to fly.

2. *To cap whiter.* The Italians can be selected so they will cap as neatly as the blacks, if care is taken in selecting colonies for drones as well as queens.

3. *To swarm less.* Some say it can not be done, reasoning from a false analogy. They say it is like the breeding instinct—it can not be overcome; that it is a sign of energy, etc. So is stinging a sign of energy, and the gathering of large quantities of propolis. But in all three cases it is energy misapplied. We want bees that will turn their energies to our profit. In this case we are trying to get rid of an instinct. It is exactly similar to the sitting instinct in hens. We know that the sitting instinct can be almost entirely bred out of chickens, so we can produce bees that do not swarm, if we allow time enough. How long will it take? I don't know. Perhaps fifty years, perhaps a hundred. But we can produce bees at once that will swarm less than their ancestors did, simply by breeding from those that swarm the least.

4. *To sting less.* I think no one doubts that gentleness can be produced by selection. I have seen a strain of Italians so gentle that they could hardly be induced to sting, but they were very poor workers. The trouble was, they had been bred for gentleness and beauty, to the entire neglect of more important qualities. I would never raise queens from a very cross colony, no matter how much honey they stored; nor would I use poor workers to breed from, merely because they were gentle.

5. The constant temptation of the queen-breeders is to breed for beauty alone, because that is a quality that is at once apparent, while for other qualities it takes time to decide. But for the average bee-keeper, who keeps bees for profit, beauty must be pushed to the very end of the list of desirable qualities. So I think we had better confine our efforts in that direction to keeping three yellow bands. *The more qualities we breed for,*

the less we shall get of each particular quality; and it seems to me that beauty is the least important of all to the honey-producer.

To sum up the whole matter, I would first get a good strain of leather-colored Italians, then continually breed for the best, choosing one or two colonies that, all things considered, have given the largest net result with the least care and labor. Raise queens from the one or two best colonies only, but use several of the next best for raising drones.

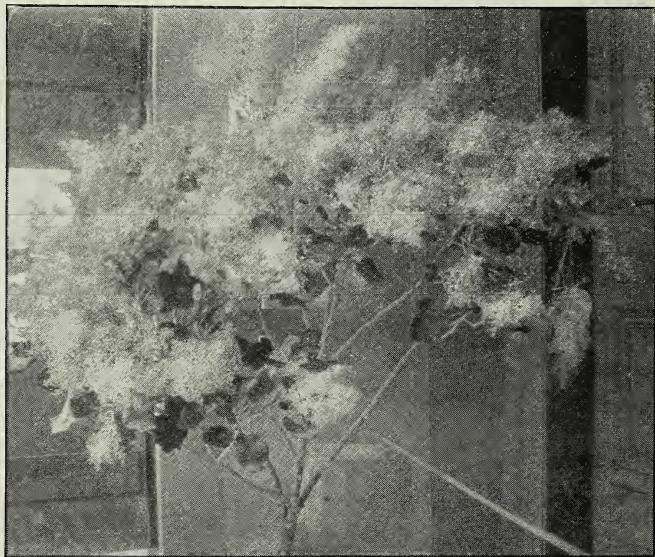
Newman, Ill.

BEE-KEEPING IN NEW ZEALAND.

A Honey-plant that is Supposed to be Poisonous for Cattle.

BY STEPHEN ANTHONY.

The engraving shows a great honey-plant in this locality. It is not exactly a tree, although our government calls it that, and includes it in the family of *Corneaceæ*. It grows in the bush or anywhere wild, on any kind of soil; has a profusion of creamy flow-



A NEW ZEALAND HONEY-PLANT BELONGING TO THE FAMILY OF CORNEACEÆ.

ers lasting pretty well through the season according to situation (gullies first), and the bees are on it all the time. I think it gives an especially fine flavor to honey. It grows easily, but can be easily handled so as not to become a nuisance.

It is supposed to be poisonous to cattle (it certainly is narcotic), but this statement is modified in that it is so only when in bloom, and only when taken on an empty stomach. I have seen our cattle eat it many times, and as a rule I never stop them. None ever suffered from its effects. Cattle do not

each much of it; i. e., they do not make a meal of it, but take it only as if it were a tonic. If they were compelled to eat it altogether, or got into a habit of it, then of course there might be trouble.

Some one (usually a native) gets poisoned every year about here through eating bush honey (usually not capped), and puka-puka usually gets the blame. Mr. Hopkins had a look at a case of Maori honey-poisoning last year, and I think puka-puka got the blame; but the fact is significant, nevertheless, that it is the Maoris only, or principally they, that get po'soned, and in that case the honey eaten is never capped.

Wastete, New Zealand.

ALFALFA IN NEBRASKA.

Conditions which Affect the Yield of Honey; Irrigation; How the Shallow Hive Outstrips the Eight frame Dovetailed.

BY D. R. WAGGONER.

My apiary is a small one, only 64 colonies, and is located eight miles north of the 40th parallel of latitude (south State line), and about 22 miles east of the 100th meridian, in Nebraska. We have about 24 inches yearly average rainfall, of which 17½ falls from April 1 to Oct. 1, during the growing season.

In a normal season our bees begin to raise brood rapidly, and build up when the fruit-bloom comes. This consists of wild plums, apples, cherries, peaches, apricots, etc. In June, when the first crop of alfalfa begins to blossom, we may expect swarms until this crop is cut, when swarming will stop. Cutting this crop begins very soon after the first blossoms appear, and lasts about three weeks. In July the bloom starts on the second crop of alfalfa where the first crop was cut earliest, other fields following in the order in which they were cut the first time. In a normal year we expect our main surplus of honey to be stored from the second crop of alfalfa. If there is plenty of rainfall during July and August, so that heartsease is abundant, we get a good yield in August, and until the frost comes, from this latter plant. These are our main sources of nectar, but of course we have others to help us along.

This year the fruit-trees were covered with blossoms, but the frosts killed them all so that our bees built up very little previous to June unless they were fed. They stored quite a lot of honey from the first crop of alfalfa, and things surely were on the boom with the second crop. Swarming did not begin until the second crop was in bloom. This year there was really no intermission between the blooming of the first two crops of alfalfa, for by the time the first crop was all cut the second was beginning to bloom where it was cut earliest the first time. At this writing (Aug. 12) bloom is coming on the third crop just as the last of the second has been stacked.

Within 1½ miles of my apiary there are 350 acres of alfalfa grown without irrigation. Thus it will be evident that this plant is the main source of our honey crop. This year especially it will be about the only source.

The yield of nectar from alfalfa varies much in different years in this vicinity where there is no irrigation. In order to secure a good crop of alfalfa honey it is necessary to have a vigorous growth of the plant, plenty of bloom, and a bountiful supply of nectar in the bloom. If there is a reasonable amount of moisture in the ground by May 1 to start a good growth of the plant for the first crop, and a good rain comes just after each hay crop is cut, a strong growth and plenty of bloom is assured. If moisture is lacking very much at these times the growth will be short and the bloom scanty. If a great excess of rainfall comes when alfalfa is just fairly in bloom there will be a deficiency of nectar in the bloom. For instance, in June, 1906, we had here 12.73 inches of rainfall; and in July, 9.26 inches. This was excessive during the months of bloom for first and second crops of alfalfa, and my bees made me only 6 pounds of surplus that summer per hive, spring count, owing to the lack of nectar in the bloom. In regions where irrigation is the rule the amount of moisture supplied to the plant can be regulated so as to secure a more uniform yield of honey from alfalfa.

SECTIONAL HIVES SUPERIOR TO FULL-DEPTH LANGSTROTH, AND WHY.

When I began bee-keeping I was green at the business, and hardly knew what kind of hive to use as the best and most convenient. I happened to choose a sectional hive for my own colonies, and I must say that I have never regretted my choice. The bees I took on shares were in regular eight-frame Dovetailed hives. The sectional hive I use is very simple in construction. Each of the two brood-chambers is 17 inches long, inside measure, eight-frame width, and 5½ inches deep, containing eight shallow Hoffman frames. I gave my neighbor's bees in the Dovetailed hives with deep frames just the same care I did my own; and in the two years, while I had the two kinds of hives in my yard I was surprised to see how much better the bees would winter in the divisible hive than in the deep-frame hive. I am thoroughly convinced that, where the bees in the cluster can have access to winter stores by means of the bee-space between the two sets of frames without being compelled to leave the cluster and travel over the top, under the bottom, or around the ends of the large frames to get feed, they will and do winter better, and come out stronger colonies in the spring. Nobody in this region winters bees in the cellar.

I run entirely for comb honey. My supers are 4½ inches deep. I use plain 4½×4½ sections with fences. Since the supers are only 17 inches long in the clear, the sections rest on plain slats ½ in. thick instead of in section-holders with end blocks between the sections and the ends of the hives. For the life

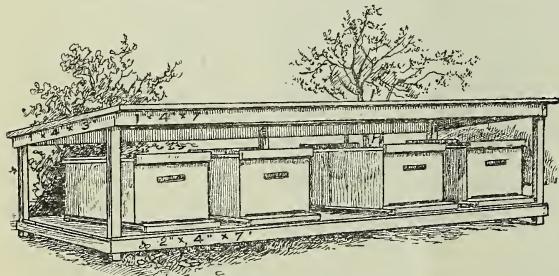
of me I can not see why any one should prefer a section-holder to a simple slat. I am not bothered any to speak of by slats sagging. If they should show any signs of doing so I just turn them the other side up for a few times.

SPRING MANAGEMENT.

In the spring or early summer, just before the alfalfa comes into bloom, I set a clean bottom-board beside one of my hives, separate the two sections of the brood-chamber, put the top one on the new bottom-board, lift off the cover, and put it on the section of the brood-chamber yet on the old bottom-board; then I set this section on top of that which I had placed on the clean bottom-board; lift up the old bottom-board and clean it well, and, lastly, set the hive just where it stood before. This shift I make through the entire apiary, as it disarranges the brood and leaves a space free of brood in the center of the hive with brood both above and below it. The queen will hustle to fill up the gap with brood, and by the time the honey-flow comes the bees go to storing in the super more readily, make stronger colonies to work during the flow; and, if we give them room enough in supers to store surplus they will, I believe, yield a better income to the bee-keeper. I consider the ease of making this spring interchange of the brood-chambers a great advantage of the divisible hive, to say nothing of the gain of having the combs in the frames built solid to the bottom-bars as a result of the change or the well-known advantages of handling hives rather than frames in working among the bees.

HIVE-STANDS.

I have my hives set on stands 7 feet long, each stand accommodating four hives. The following is a diagram of one of these stands:



WAGGONER'S HIVE-SHED.

The hives are set in two pairs with a space between each of the pairs the width of a hive. This is convenient when making the spring interchange of brood-chambers above mentioned. The 2×4 -inch sills on which the hives rest are $1\frac{1}{2}$ and 2 inches from the ground, the rear sill being the highest. The roofs of the stands are made of light $\frac{1}{2}$ -inch boards, and are high enough above the hives to allow of necessary tiering up and easy handling of supers.

As a convenience in hiving swarms which

cluster 8 to 10 feet above the ground I use a ladder, a diagram of which is shown on next page.

This ladder can be set under the cluster with the legs spread to suit, the hive set on the platform at the top of the ladder, the bees shaken down on the hive with cover off; and when the bees are almost all in, or when one wishes to carry the hive to its permanent stand, he can spread the legs of the ladder so as to lower the platform and allow him to lift the hive off easily. The platform remains level, no matter how much the legs are spread. The ladder can be folded up just like an ordinary step-ladder. The legs are sawed out of 2×6 -inch stuff, $3\frac{1}{2}$ inches wide at one end and $2\frac{1}{2}$ at the other. A season's use of this ladder has proved it to be a great convenience.

PREVENTING PARTLY FILLED SECTIONS.

Toward the close of the honey-flow, in order to have as few partly filled sections as possible I use dummy boxes as long as the super is inside, and as wide as the super is deep. These boxes are made as deep as the width of one or two rows of sections, including separators. I place one of these, either the one or two row size, on each side of the super with the open part of the box close against the side of the super, and put the partly filled sections, if I have any, over the center of the hive where they will have the best chance of being finished up and capped over. I described these in GLEANINGS some months ago.

AN IMPROVEMENT IN BEE-ESCAPE BOARDS.

When I take off honey I use the Porter escape with two very narrow strips tacked on the upper surface of the board, one end of each strip being at the edge of the hole in the escape and the other at the rim on the side of the board. The little strips guide the bees to the escape, and the super is cleared of bees in about two-thirds the time it would be without them.

Some time ago I mentioned this in GLEANINGS, and Dr. Miller in his notes said it would be better to have *four* strips leading, one from each corner of the rim to the hole in the escape. With all respect to the opinions of an expert like Dr. Miller I will tell why I prefer my way. First, the more ends of little sticks you have around the hole, even though they be narrow, the less room there is for the bees to get down into the hole. A steady stream of bees going to the hole, and plenty of room to get down into the hole, is what we want. We want to avoid a jam of bees at the hole the same as we would a jam of schoolchildren at the head of a stairway in case of an alarm of fire. Second, just notice bees follow around the rim where the strips reach from the four corners of the escape-board to the hole. When they come to the *acute angle* made by the rim and the little strip they will back out, turn around, and go back the way they came, instead of going to the hole in

the escape; whereas if the angle is a right angle they will be more likely to turn the square corner and follow the strip to the hole.

If you don't believe this, just fix a strip at an acute angle and one at a right angle against the side of a window-light or screen where bees are trying to get out, and watch their movements. Third, the distance in an



A CONVENIENT STEP LADDER TO BE USED AT SWARMING TIME.

ordinary eight-frame Dovetailed hive from the center of the rim at the end of the board around to the center of the rim at the side, and thence to the hole in the escape, is $20\frac{1}{2}$ inches. The distance from the center of the rim at the side to the corner and thence direct to the hole is $19\frac{1}{2}$ inches. These are the longest distances bees would have to travel in following the rim and strips as guides in the two plans of arranging the strips in order to reach the hole. So the only gain in distance of travel by Dr. Miller's plan would be at best $1\frac{1}{2}$ inches—not enough to compensate for the other disadvantages.

HOW TO GET THE FILLED SECTIONS OUT OF A SUPER.

When I wish to empty a super full of honey I first, if necessary, run a sharp thin case-knife blade around between the sections (or section-holders if one uses them) and the super-shell. Then I take out the wedges or springs. I next set the super on a box turned bottom side up and placed on the work-bench or a table. The box is $5\frac{1}{2}$ inches deep,

$15\frac{1}{2}$ long, and $11\frac{1}{2}$ wide, all outside measure, being one inch deeper, $1\frac{1}{4}$ shorter, and $\frac{1}{8}$ narrower than the inside measure of the super. Next I tap sharply with a hammer or mallet on the corners of the super-shell until it is loose, and then shove it down on the table, leaving the entire contents of the super resting on the box up above the super-shell, where I can pick off the separators and sections with the greatest ease. It is much easier to pick sections off from simple slats than out of section-holders. Try this scheme of emptying supers for the sake of convenience and good temper.

I market my honey cased in the neatest style, within 30 miles of home. One large town of 4000 inhabitants, situated on the high divide, where alfalfa does not succeed as a crop, takes a large share of my surplus. I have little showcases made with molded top and base, stained a walnut color, and varnished, which hold either six sections in two tiers or four sections in one tier, displayed through three-inch glass. These filled with honey are to stand on a counter or on top of a large showcase in a store to attract customers, and let them know that the merchant has choice honey in cases back on the shelves to sell. The little showcases cost 25 cents each, and help the merchant and myself to make sales.

THE BEE-KEEPERS WHO HAVE FAILED.

I am no professional bee-keeper, only an amateur. There have been many of my neighbors who have started keeping bees here in the last ten years, and are now out (or as good as out) of the business. I wish to impress on

those who think that about all a bee-keeper has to do in a year is to hive swarms and put on and take off supers, while the bees will take care of themselves and do all the rest, that they will be disappointed if they attempt to do business on that basis. I know of no employment which requires a man to be a natural mechanic, to be resourceful, to take advantage of little things to prevent even small losses, to be everlastingly watching the little things and doing the right thing at the right time, more than bee-keeping, if one expects to realize a fair profit. I have stayed with it, and have found a reasonable profit and much pleasure in running a small apiary.

Stamford, Neb.

[Unless the apiary were in an orchard of small trees so that all swarms would be rather near the ground, we should think an ordinary covered basket or swarm-catcher on the end of a pole would be handier. The pole could be propped up to bring the basket at any height; and when the bees are clustered there can be taken to the hive.—ED.]

ARE BEES REFLEX MACHINES?

**Experimental Contribution to the Natural History of the Honey-bee by
H. v. Buttel-Reepen, Ph. D. Translated by Mary H. Geisler.**

Continued from Feb. 15th issue.

THE MEANS OF COMMUNICATION IN BEES.

According to Bethe, there is not "the slightest doubt" that bees recognize each other or hive strangers only by odor (chemical substance), and that no special means, neither a "sound" nor a "definite movement of the antennae," comes into question as possibilities for communication.⁴²

Long-continued and careful observations, however, yield many data which do not coincide with this view.

INVESTIGATIONS WITH COLONIES FROM WHICH THE QUEENS ARE TAKEN.

If the queen is taken from a very strong colony of 50,000 to 60,000 bees or more, the loss is first noticed sometimes after an hour, sometimes after many hours. This is particularly the case if the removal is made during a rich honey-flow when the bees are busily occupied with bringing in and storing the nectar. A striking change then suddenly takes place; the comfortable humming gives way to a louder, long-drawn-out, lamenting buzz.⁴³ The guards at the entrance and those providing the ventilation become uneasy; excited bees come out of the hive and run over it as if seeking something; single bees fly away quickly, then back; the whole character of the colony is changed, not only in outward behavior but also in inner disposition. They are very irritable, and inclined to sting. I have sometimes noticed the queenlessness of colonies, which usually were very gentle, by the increased desire to sting. Such notice is, of course, possible only to one who is used to working without veil or gloves.

If the door⁴⁴ of a queenless colony is opened, the same agitation is seen in the interior, and smoke blown in only increases the buzzing. This excitement over the loss of a queen often appears very soon after her removal, particularly when there is no forage or if the colony is weak.

The difficult question now arises, how bees notice the absence of the queen and how they communicate this loss. Is it the sudden absence of her odor? Hardly, at least not in all cases, for we have seen in a previous paragraph that the odor of the queen is exceedingly adherent, and therefore the walls, as well as the bees, must be impregnated with it. But the intensity is gradually becoming less. However, this odor is variable in the customary course of events,⁴⁵ and so no uneasiness of any kind arises on this account. Furthermore, how does it happen that the bees *suddenly* become agitated after the queen has been taken out sometimes for an hour or more?

If Bethe is right, that the means of communication depend upon the outflow of some chemical, then the above observations would prove at least that the odor of the queen is a very dominant one in the colony. The queen then does not, as Bethe declares, take on the hive substance, but just the opposite happens; the queen influences the hive odor

⁴² Bethe, 1. c., p. 70.

⁴³ That "agitated bees" constantly "buzz" is a misleading expression of Bethe's. Particularly can the humming with raised abdomens and fanning wings upon the flight-board be sharply distinguished by the trained ear from what is usually called the "buzzing" of bees, by the pitch.

⁴⁴ Reference is here made to the German style of hive with a door in the rear. The American style of hive opening at the top is little used in that country.—E. F. P.

⁴⁵ If the queen gets into the honey-chamber, which is generally separated from the brood-chamber beneath by a strong piece of board with slits in for the passage of workers, and if she there continues to lay eggs, it is clear that her odor must soon be lost to the bees beneath. This is especially true if there is an entrance into the honey-chamber. Under these circumstances, however, excitement at the queen's absence never breaks out; at most the "isolated" bees after a few days occasionally build queen-cells, but more often not.

considerably, or at least a mutual scenting takes place. On the other hand, if we agree with Bethe in his statement that the queen takes up the hive substance of the colony, the means of communication must depend, not upon reflexes of smell alone, because the colony odor would not be influenced by the removal of the queen.

If we were to ask bee-keepers their opinion in this matter, they would probably answer that the young bees which care for the feeding of the brood and the queen, "miss" the latter after a longer or shorter period, and begin to seek her diligently, communicating their anxiety to the whole colony until the "conviction" that the queen is gone comes into consciousness, when the comfortable humming changes to a loud buzz.

But since the young bees, as all bee-keepers know, can be taken away very well with the queen it naturally follows that they take no very important part in this matter. Then the old bees will begin the loud buzzing.

One can, however, ingeniously gather a colony of old workers and place within it a queen enclosed in a cage. The excited colony is quieted as if by magic. The hostile bees next to the cage begin to lift their abdomens, fanning their wings,⁴⁶ with a characteristic humming. This hum is taken up by other bees, and suddenly there is peaceful quiet.

Before we formulate conclusions from the foregoing let me communicate further observations.

The following experience is interesting, and proves that the feeding of the queen as one of the chief phenomena of life needs not to be taken into consideration in the breaking-out of the agitation over the loss of a queen, apart from the odor.

In bringing in a first swarm, I crushed the queen by accident. Since I could not care for it on that day nor the next, and I did not have another queen at my disposal to substitute, I knew that the swarm would certainly fly out again and join the mother colony. To prevent this, I arranged the following experiment: I fastened the dead queen with a needle to a piece of cork and hung it in the cluster of bees. The colony remained quiet, and I knew later on that it had felt entirely queen-right because the comb which it made showed no drone-cells, and the dead queen was surrounded by licking bees.⁴⁷ How long a dead queen can supply the place of a living one I am not able to tell.

However, even a dead queen may be dispensed with. In order to do this, I put a weak colony into swarming condition—that is, took away all combs so that the agitation could be more quickly observed. The queen was put into a cage. The next day I took the cage out of the colony, and very soon I noticed the typical signs of queenlessness. When the excitement seemed to have reached its height I opened the glass door and held the cage, from which the queen had been quickly taken, in the midst of the bees. Immediately it was surrounded by many "joyful" bees with lifted abdomens, fanning with their wings, and the buzzing ceased. Here we have conclusive proof that the odor of the queen is enough to satisfy all the instincts which appear unsatisfied during the excitement over the absence of the queen.

The conclusion may easily be drawn that, if the weak odor adhering to the queen-cage causes a cessation of the agitation, and certainly it is the odor alone, the disappearance or weakening of the same causes the outbreak of the uneasiness. But this deduction does not seem conclusive to me; for, as I have said above, the odor does not disappear with the removal of the queen, but is, however, weakened; and if the colony is vigorous, and their instincts are diverted by a rich honey-flow, the bees notice the loss only after some time has passed. But in the case of the sudden outbreak of uneasiness over the absence of a queen, we have to do with an intensified instinct, for which the shadowy memories in actual requirement are sufficient for the needs of the case, if I may so

⁴⁶ In the original, the author characterizes this peculiar humming as "sterzeln." This he describes in a footnote as follows:

"By 'sterzeln' is meant that characteristic raising of the abdomen, accompanied by a slow whirring of the wings, which indicates joy. Therefore it is seen in the above case, or when they discover the hive after going astray, but never on finding a honey supply, even if very hungry. This is similar to what I might call the attitude of fright. If the finger is approached to the entrance of a hive, single bees guarding the passage are seen to hasten toward the hostile object, raising their abdomens in threatening manner, and they remain in this position."

⁴⁷ A queenless colony will erect drone-cells if it builds at all.

express it. Thus bees in the spring, impelled by necessity in a region where there is little pollen, will gather the dust from thrashing, coal dust, or brick dust, instead of the lacking pollen. Once I observed bees collecting even sawdust. It is just as little permissible to draw from this the conclusion that brick dust is equivalent to pollen, because bees react in the same way toward both, as it is to conclude that it is the missing odor alone which causes agitation in a stock, because the bees are satisfied with the remembered odor in place of the real queen. We shall have better proof further on.

BEHAVIOR OF A QUEENLESS SWARM.

As a first swarm was issuing I caught the queen at the entrance of the hive. Now instead, as happens in most cases, of the swarm returning to the hive after the vainly searching circling, the bees hung to a branch united in the well-known cluster. Since no alarm was shown, I took it for granted that a second queen had swarmed with them; but a prompt examination of the hive revealed no queen-cells from which a young queen could have emerged. The swarm was perfectly quiet for over half an hour, then suddenly broke up and went back to the hive—a certain proof that it was queenless. In this case, then, there was a considerable time between the removal of the queen and the breaking-out of the uneasiness over her absence. It was evidently not the disappearance of the odor of the queen that caused the discontent, for the odor was lacking from the beginning. Queenless swarms rarely take place; and if they do, they do not settle and disband again: they miss the queen immediately. Coming out into the open air, the odor of the queen seems to be of little value. This is evident from the fact that if one keeps a caged queen in a circling swarm, it has to remain there for a long time before she is scented by the bees, if she becomes scented at all. But if a bee once places itself upon the cage, "joyously" lifting the abdomen, and humming, then it is not long before the rest are attracted by the sound of the "satisfied" hum. I might, incidentally, mention that there is a so-called "diamond rule" among bee-keepers. This rule is that the queen is to be enclosed in a cage for a short time before and during a rich honey-flow in order to hinder her from laying eggs. The bees then will have little brood to care for; the consumption will be diminished, and the honey store should increase. This, however, frequently does not take place, because the normal condition of the colony is disturbed. The colony often believes itself queenless and builds queen-cells in spite of the imprisoned queen in the middle of the colony; but this phenomenon does not appear in all colonies.* Apparently there is here, as has been demonstrated before, an unsatisfied feeding instinct. The nurses can not distribute the richly prepared larval food, and so the impulse is generated to remove the abnormal condition by building queen-cells. I can imagine this as an example of a clear reflex. There is no need whatever for "reasoning" of any kind.

I shall now return to the very vigorous colony mentioned before. If the queen is taken away from such a colony, which compactly filled the brood-chamber and honey-chamber in a large hive, the signs of uneasiness over the absence of the queen will go on as described. When the colony is in greatest excitement, a cage containing a queen may be pushed into the honey-chamber in the upper part of the hive which opens from behind, and then the condition of the bees at the entrance at the opposite end of the hive underneath in the brood-chamber may be observed. Almost at once a change in the behavior of the uneasy bees is apparent; the buzzing dies out in the hive, and the bees, searching around at the entrance, enter with lifted abdomens and fanning wings.

The explanation can here certainly not be the influence of odor, since the odor of the queen could not penetrate in an instant to the entrance which is separated from the honey-chamber by the whole of the brood-chamber. If the extraordinary penetrating odor of female insects be cited, as, for example, that of the moths (*sphinx*, etc.), then I would reply by referring to the disregard of an imprisoned queen in a swarm.

* It is curious that queen-cells are also established if the queen is decrepit. If, therefore, queen-cells are found, and at such a time either strongly defective brood or drone brood in worker-cells (on account of and at such a time either strongly defective brood or drone brood in worker-cells (on account of the exhaustion of the supply of sperm-cells), then one can be sure that the old queen will shortly disappear from the hive. Perhaps the same instinct is active here as in the case of an imprisoned queen (see footnote, p. 11).

DISREGARD OF A QUEEN IN OPEN AIR.

In order to demonstrate this question still further I hung a cage containing a queen on a stick and stuck this into the ground so that the cage was at the same height as the hive entrance, about thirty-five centimeters to one side of the flight-board. None of the numerous bees flying in and out scented the queen, which remained entirely unnoticed while the colony continued agitated.

HEARING CAPACITY AND SENSATIONS OF SOUND.

If we now conclude from the foregoing observations in what way the discontent because of the absence of the queen, as well as the content because of her presence, is communicated, and what the means of communication are, we must conclude that the odor is not the only factor. We have been able, on the one hand, to determine with reasonable certainty that, if the odor were sufficient to inform the colony of the presence or absence of the queen, no other special kind of communication need be used; on the other hand, we saw indications of discontent (for example, the building of queen-cells) among bees when a queen was present in a cage. So we see signs of peace or agitation in cases where the influence of odor seems completely excluded. In all observations, when the colony notices the absence of the queen there is always a change in the usual characteristic sound in the hive, the bustle of the colony, if I may so express it.

There is, therefore, not the slightest doubt in my mind that bees communicate with each other by sound. The tone of "peace" attracts hive mates or quiets them; the louder buzzing excites them: it disappears if the queen is given back. At the same time the whole character of the colony changes,⁴⁹ the queenless irritable bees become quiet and peaceful, and again take up their work, which was laid aside during the excitement. We must admit the possibility of communication between bees by sound, therefore of hearing capacity and sound sensations.⁵⁰ Each bee has the instinct to join in the tone of discontent if it hears it; therefore if the absence of the queen is noticed by one bee the agitation is very quickly propagated throughout the colony.

How the first notice of the lack of a queen takes place is naturally, as before stated, very difficult to determine—perhaps there are several possibilities. Often the absence of the queen odor may bring about the result; it may be the absence of the characteristic humming described, which the bees occupied with the queen produce. Further, it is possible that the queen herself makes sounds, the absence of which is noticed. I have never heard such a humming, but it is not impossible that such tones, not perceptible to the human ear, exist.

EXPERIMENTS ON SWARMS.

The following observations will show to what a great extent the means of communication between bees depend upon sound perceptions. The loud buzzing of swarms is readily distinguished from the usual hum by anybody who has been occupied with bees for any length of time. The swarm presses out from the hive in impetuous haste in the peculiar swarm dance; it surges and whirls in "bacchanal delight," as if the bees were really drunk with "joy." The "swarm dizziness," as bee-keepers say, has seized it. In this dizziness it forgets everything connected with the old dwelling, and bees even forget to sting.

"Swarming bees do not sting" is an old bee-keepers' saying. From this we get the old fable that bees recognize the bee-master, because, generally, outsiders approach a bee-hive only to see the interesting spectacle of a swarm, and then notice the bee-keeper,

⁴⁹ Careful observation will show that every colony has its particular character, which is determined in part by the strength of the colony. On the other hand, we often see what are apparently great differences in colonies of like strength. One colony is gentle; another constantly desires to sting. One defends its hive entrance carefully; another almost not at all, although it is a strong colony. One flies constantly earlier than its neighbor, etc. Lubbock and Herman Müller have shown that individual bees vary also. (Hermann Müller, "Versuche über Farbenliebhaberei der Honigbiene," Kosmos, Jahrg. 6; Lubbock, "Ants, Bees, and Wasps," German translation published in Leipzig, 1883, English edition in the International Scientific Series, New York, 1888.)

⁵⁰ In the attraction of a queenless colony into the hive of a queen-right one, then, perhaps in the first place the hearing capacity comes into question (see p. 5), the sound of the contented humming acts as a powerful stimulus and causes the migration.

often quite unprotected, quiet and composed, stand in the middle of the tumult without being stung.

The "Deutsche Bienenfreund," 1894, reports the following: "A boy about ten years old was standing near a hive, bare-headed and shirtsleeved, when a swarm issued. After flying here and there, the queen alighted on the boy's head, and thousands of bees quickly followed. The boy's father, recognizing immediately the state of affairs, called to him hastily (he had often looked on during the catching of a swarm), 'Do not move, Hans. Shut your mouth and eyes, and breathe through your nose. I will sprinkle and capture them!' The boy obeyed, the father poured water over his head, bent it forward, and with a feather stroked the whole swarm into a basket underneath. The boy had not a single sting."

After my own experiences, I consider this tale entirely trustworthy.

In 1893, "Studers ill. Schweizer. Bienenfreund" showed the picture of a young bee-keeper who had been photographed with a swarm which hung down from his hand. In the issue of the swarm he caught the queen with his fingers, thus causing the swarm to surround his hand. When the photograph was completed, three-quarters of an hour had elapsed, which was endured very quietly, the arm being supported with a stick. Head and hands were not stung. Similar pictures have been published in "Gleanings in Bee Culture" during the last few years.

It is not in contradiction to the above to say that most disasters are caused by swarming bees, for nervous blows or accidental crushing irritates the swarming bees; and first one sting, then hundreds follow, excited by the strong odor of the poison.

Shortly before the issuing of the swarm, single bees are seen coming out with uneasy motion; they press through the bees around the entrance, which often cling closely together like a long "beard" hanging from the flight-board. It can hardly be doubted that sounds of some kind perhaps serve here for communication—sounds lost to the human ear in the general hum;⁵¹ at least there is no more plausible explanation for the peculiar result, for suddenly the "beard" loosens, the bees enter the hive quickly, assail the honey stores, and fill their honey-sacs. All the others desiring to swarm do the same thing, and suddenly the swarm breaks forth. Those just returning from the fields heavily laden with pollen are involved in the tumult, infected with the sound of swarming, and fly with the swarm.

THE INFECTING INFLUENCE OF THE SWARM TONE.

That the sound made in swarming, which is given only in flight, is infectious is well known; for now and then it happens that the neighboring colony, though not nearly ready to swarm, will follow the swarm-tone and swing into the air. If two swarms issue at the same time, they mutually attract each other and unite.

That we have here to do with a chemical reflex, as is thought by Bethe, who, strangely enough, does not take swarming into consideration, seems improbable to me. If the rich possibilities for sound communication between bees are borne in mind, it is evident that this capacity must have some object, and that it is not practicable to ignore these data.

THE ENTICING NOTE OF BEES.

If a swarm is shaken out on a sheet spread over the grass, and a hive never before used is placed, for instance, on the north side of the sheet, it will remain unnoticed if it has not come in direct contact with the swarm. But if a handful is scooped up and thrown at the entrance, they will immediately draw near with specially loud humming, part standing outside, however, on the flight-board with lifted abdomens and wings fanning. All the other bees near by turn, if they have been facing away from the hive, and follow the alluring sound, lifting their abdomens and fanning with their wings. More keep following, and a broad band march into the dwelling. If now the hive is taken away and placed on the south side, the bees quickly march on further north, but for only a short time. Then the increase of the attracting note from the south causes a gradual turning

⁵¹ Movements of the antennæ should certainly be considered, since the play of the antennæ is always lively, and often a mutual touching takes place.

of the stream, which enters the hive little by little. It may happen that a little cluster of bees advances firmly northward, although many mates turn toward the south. The alluring tone does not seem to penetrate further; they heard it coming from the north and follow the memory. There seems to be no other explanation for this course. In my opinion the fact that not only a single bee but plenty of them, a small cluster, follows this memory is a proof of the impulse for imitation which is undoubtedly present in bees for it is not likely that every bee in the small cluster has this memory but perhaps only a few of them. The others follow only on account of this impulse for imitation. If the first bees remain true to the direction, then a great number will turn quickly with them.

It must really seem strange, to any one familiar with the natural history of the bee, that there can be any doubt as to the possibility of communication through sound, when the whole life of a bee is one continuous humming, if I may so express it. Can this "audible speaking" have no purpose? Only the dead bee is quiet.⁵⁴

If the previous assertions are not convincing, we may find proof of their capacity for hearing in the following:

THE "TEETING" AND "QUAHKING" OF THE QUEEN.⁵⁵

When the first swarm has issued with the old queen, normally nine or ten days pass before the after-swarm follows. One or two days before the swarming, a strange concert may be heard in the hive on a quiet evening at a distance of a couple of steps. It is the "teeting" and "quahking" of the young queen. As is well known, the old queen, before her exit, lays eggs in the queen-cells at intervals every day or so; the consequence is, that the young queens do not all emerge at once.

The first queen to emerge falls upon the other queen-cells in order to kill her rivals. If the colony wishes to swarm, however, the workers prevent this destruction, and the queen begins to "teet" in "jealousy." She presses her head against the comb, as I have observed, and sounds a clear, ringing, long-continued "teet, teet," apparently using the stigmata on the thorax. Immediately the most mature of the queens still in the cells answers with a short deep "quahk, quahk." Thus this interchanging goes on for hours or days with shorter or longer interruptions. If rainy weather prevents the issuing of the swarm, and more queens mature, they "quahk" likewise. They "dare" not emerge as long as the "teeting" goes on; and since they need nourishment they cut a little slit with their mandibles, through which they stick their proboscis, and so are fed by the workers.

It would lead me too far to go further into these interesting circumstances.

If we can prove from the above an undoubted capacity for hearing, we can also from the following experiment:

THE QUEEN'S TONE OF FEAR.

If a strange queen is put into a queenless colony by merely allowing her to run in upon a comb, then the bees nearest her fall upon her and bite her legs or ride upon her to sting her. The powerful queen runs quickly away from her persecutors, but she is continually seized by others. Now in her "fear" she utters loud cries which throw the whole colony into excitement. One could here conjecture the influence of odor; but a strange queen in a cage does not cause such excitement, especially not if the colony is queenless. It is doubtless the tones of fear which stir up the whole colony. We have here again an unmistakable reaction toward sound-sensations.

The attempt might be made to weaken these assertions, so far as they apply to the existence of hearing capacity, by pointing out that no one has yet succeeded in showing in insects a reaction toward sounds artificially produced. Then I would call to notice that recently an American has obtained undoubted reactions toward the notes of tuning-forks in two members of the Formicidae⁵⁶ (*Lasius Americanus* and *Formica nitidiventris*)

⁵⁴ 1. Ernst Haeckel, *Die Welträtsel*, Bonn, 1899, p. 145.

⁵⁵ 2. Now and then the colonies settle down in their winter sleep into a condition of complete quiet, but usually it is accompanied by a hardly audible murmur.

⁵⁶ It is, of course, very difficult to represent these sounds in words; but the ones here given are often used in English to represent them. No bee-keeper will have any difficulty in knowing what is meant. The author represents them in German by the words "Tüten" and "Quaken." — E. F. P.

⁵⁶ *Science* (The Sense of Hearing in Ants), No. 5, Vol. X., No. 256, 1899. See also my Conclusion.

and in two Myrmicidae (*Crematogaster lineolata*, and a kind of *Aphoenogaster*). The well-known myrmecologist William Morton Wheeler has meanwhile published in an important paper (Ethological Observations on an American Ant, *Journal für Psychologie und Neurologie*, Bd. II., Heft 1 u. 2, Berlin, 1903), his investigations on hearing in ants. He writes as follows:

"Stridulation, at least among the Myrmicinae, Ponerinae, and Dorylinae, is an important means of communication, which Bethe has completely ignored, and even Forel and other myrmecologists have failed to appreciate. It readily explains the rapid congregation of ants (Myrmicinae) on any particle of food which one of their number may have found, for the excitement of finding food almost invariably causes an ant to stridulate and thus attract other ants in the vicinity. It also explains the rapid spread of a desire to defend the colony when the nest is disturbed. This is especially noticeable in species of *Pheidole*, *Myrmica*, and *Pogonomyrmex*. It is the secret of being able in a short time to catch ants like *Pogonomyrmex molefaciens* in great numbers by simply burying a wide-mouthed bottle up to its neck in the mound of the nest. An ant approaches and falls into the bottle. It endeavors to get out, and, failing, begins to stridulate. This at once attracts other ants which hurry over the rim and forthwith swell the stridulatory chorus till it is audible even to the human ear. More ants are attracted, and soon the bottle is filled. If it be corked and shaken for the purpose of still further exciting its contents, and then held over another *Pogonomyrmex* colony whose members are peacefully sauntering about on the dome of their nest, the wildest excitement will suddenly prevail, as if there had been a call to arms or—to dinner. Even more remarkable is the stridulation in a colony of *Atta fervens*, the Texan leaf-cutting ant. Here the different ants, from the huge females through the males, large soldiers and diminishing casts of workers to the tiny minims, present a sliding scale of audibility. The rasping stridulation of the queen can be heard when the insect is held a foot or more from the ear; to be audible the male and soldier must be held somewhat closer, the largest workers still closer; whereas the smaller workers and minims, though stridulating, as may be seen from the movements of the gaster on the postpetiole, are quite inaudible to the human ear. It is not at all improbable that all this differentiation in pitch, correlated as it is with a differentiation in the size and functions of the various members of the colony, is a very important factor in the coöperation of these insects, and of ants in general. The contact-odor sense, important as it undoubtedly is, must obviously have its limitations in the dark subterranean cavities in which the ants spend so much of their time, especially when the nests are very extensive like those of *Atta*. Under such conditions stridulation and hearing must be of great service in maintaining the integrity of the colony and its excavations. The fact that as yet no unquestionable auditory organs have been discovered in ants is of secondary importance when it can be so easily shown that these insects really respond in an adaptive manner to the sounds produced by other members of the colony."

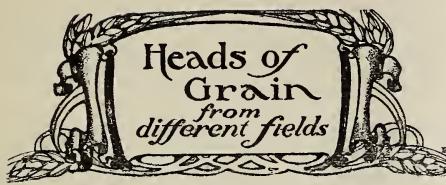
I know very well that Miss Adele M. Fielde and George H. Parker are of the opinion (The Reactions of Ants to Material Vibrations, Proc. Acad. Nat. Sc., Philadelphia, Sept., 1904) that "it is misleading to ascribe or deny hearing to ants; they are very sensitive to the vibrations of solids, not to those of air; their reactions could be as appropriately described as resulting from touch as from hearing." But the above investigations on bees have been neglected by these authors, and I am still of the opinion that a sensitivity to the vibrations of air can not be denied so far as bees are concerned, and the above experiments of Wheeler seem to show the same in ants.

To be continued.

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SWARM CONTROL.

I operate a few hives for the love of it, and for comb honey. The honey surplus is from alfalfa and sweet clover. The season extends from the middle of June to the middle of October, being most important from July 1 up to and perhaps a little beyond Sept. 1.

What results might I look for from the following method?

1. Put full body hive over the old hive and brood-nest with excluder between. When the honey-flow is well started shake all bees into the upper part; set the old brood-nest to one side, and, by changing back and forth, incorporate its bees with those in the new body. I do not wish for increase. Would this method, practiced, say about June 20 to July 1, be likely to stave off any further swarming?

2. How would it work to proceed as above, except to put the old brood-nest, after shaking, on top of the new, and its superimposed section-frames, using a Porter bee-escape between the old brood-nest and the topmost section? Leave this on until the young bees had hatched and passed down to become a part of the colony below?

3. What results would likely come from the following method? Place the old queen with proper frames in the upper hive; place a queen-excluder between the two; stop the old entrance, and make a new one between the two hive bodies. Place over the queen-excluder a suitable, heavy, flat, close-fitting cloth, except a small section cut out at the rear of the cloth, $1\frac{1}{2}$ inches square, at which point the queen-excluder should permit of the bees freely passing to the upper body and to the exit from that body to the outside. Would the bees thus gradually abandon the lower hive, and become part of the colony working from the new entrance and storing in the sections, which have, of course, been superimposed? Would it work to use the Porter bee-escape between the lower and the upper body, and so slowly empty the lower body?

I have two box hives. Rather than transpose the bees to frame hives I thought of forming nuclei in a full-size frame hive, placing the hive between the two box hives, and, about the time they are threatening to swarm, leave the box hives and remove to another place, thus throwing the field force of both these queens to the nucleus.

I can repeat this, either in the same way or to bring strength in bees to where it may be most valuable—perhaps twice more before the flow is ended.

May not these queens so kept at work, and

utilizing all their field force, be made quite as effective in producing honey as if I transferred, and the breeding-space of the box hives, which it costs nothing to preserve, is absolutely lost?

There is a plan, originated, I believe, by a Mr. Dudley, of this State, by which, in a situation as described in 3 above, he uses a tin tube on the outside, up which the bees from the lower body pass to the entrance between the two hives, this being their only egress inside or out. Then bees do not find their way back, but at once take up work at the upper entrance, and in behalf of the upper colony. Why is this cumbersome method any better than the use of the Porter bee-escape placed inside, allowing the lower hive to empty slowly into the upper with no possible return? I should very much like to hear Dr. Miller's comments on these plans.

Could I introduce a new queen by using her in plan 3, placed on one or two frames of young bees from the lower brood-nest instead of the old queen, keeping the latter below until I have secured the most of the strength from that brood-nest and am ready to get rid of the old queen?

PHILIP B. STEWART.

Colorado Springs, Col.

[The various plans of swarm control you propose have all been tried. There are two objections. First, they call for too much work; second, they do not always succeed, and are, therefore, risky. I would suggest that you follow Dr. Miller's book, "Forty Years Among the Bees," very closely. The Dudley tube is an adaptation of Langdon's device on the entrance, and I imagine it will not last long.

My experience with comb honey leads me to say that certain points are very important, and need to be emphasized.

1. Good shade; 2. Plenty of air current during hot weather; 3. A space below the frames for the bees to cluster; 4. As few "contraptions" in the hive and supers as possible; 5. Young queens.

Let the box hives swarm once. Fifteen days afterward, drive all the bees out and add them to the swarm, killing all the virgin queens. What is left is empty comb, fit only for the wax-extractor.

The nearer you make a comb-honey hive like an extracted, the better it will work. There is no royal road to comb-honey production, and plans have to be modified to suit seasons and localities —W. K. M.]

CAN UNFINISHED SECTIONS BE USED FOR EARLY SPRING FEEDING?

I was intending to ask you the advisability of putting in unfinished sections early for feed; but I see in the Jan. 15th GLEANINGS, p. 83, its disadvantages as well as advantages. I should like to know if I should put a few in each hive early in April, even before any pollen is to be found, if the bees would take the hint and use it for feed. To prevent the cooling of the hives I think there would be room to put back the cushions on

top of the super containing the unfinished sections, as I use the large chaff hives.

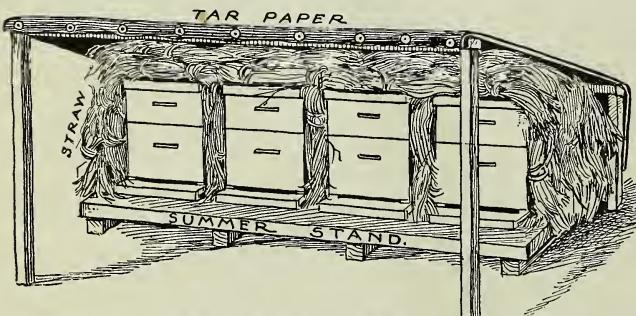
AMELIA J. CULVER.

Mt. Lebanon, N. Y.

[The bees might or might not take the honey out of the sections and use the same for brood-rearing. A good deal would depend upon circumstances. The sections should be so given as not to leave a lot of empty space for the bees to warm up. Your proposal to put back the cushions is correct in theory and practice.—ED.]

HOW TO PACK A FEW COLONIES OF BEES FOR THE WINTER.

Many small bee-keepers having from one to a dozen colonies allow them to remain on the stand all winter without any protection, and in the spring wonder why so many of the bees died. A plan by which their bees can be wintered safer and cheaper outdoors than if placed in a cellar is this: After the honey season is over, and the supers have been emptied and cleaned, I place them back again on the hives with the section slats left in. I do this early enough—about the last of October—that the bees may have time to wax things down tight between the edges of the super and brood-chamber. When very



cold weather comes on, and the bees have quit flying, I place them in a row east and west, with front to the south, and about a foot apart. I now fill each super full of old rags, pieces of burlap, or even torn-up newspapers, finishing with a quilt of burlap, and on this I place the cover proper, snug and tight. The straw (prairie hay is better) is then packed in between tight to the top of the hive and over all and behind; and at the ends I put the straw three feet deep, finishing with a cover of tar-paper tacked to two 2×4 's or scantlings the desired length, one placed in front, the other back, with slope enough to carry off water, and thus keep the packing dry. I leave the bees as they are, quite late in the spring until rains and cold chilly days gives way to warm settled weather. I then remove the winter protection and space the hives a proper distance apart again. I might also add that I place a board in front on sunny days to prevent bees from flying out and perishing. The engraving may help to explain my plan.

Tecumseh, Neb. CYRUS DOUGLAS.

[This shed would be better if the bees were made to enter on the lower (or opposite) side of it. This leaves the high side for the apiarist, so that he can handle the hives from behind instead of in front.—W. K. M.]

TESTING THE WEIGHT OF HIVES IN SPRING; “HEFTING” NOT A SAFE GUIDE.

On March 20 of last year, when I “hefted” my hives they were fully as heavy as when packed for winter. Imagine my surprise to find them, April 10, at the point of starvation. While there is no doubt that considerable honey was gathered during March, the queens seemed to think that summer had arrived, and that it was time to be up and doing. The result was, hives full of brood, and I had hefted brood instead of honey. This leads me to the conclusion that, while the hefting plan may do in the fall when you know there is little or no brood in the hive, it is not a safe guide in the spring, especially after such winters as the past has been here in the South.

Tupelo, Miss. J. D. ROWAN.

POSITION OF CLUSTER IN WINTER SEEN THROUGH A GLASS COVER.

This is the third winter that I have wintered colonies in hives with double glass covers so that I could look in at any time without disturbing the bees or letting the cold air in on them. These colonies are in pairs with only a thin division-board between them; quilts over and around them, and one outer case over all.

The winter cluster does not form near the entrance, as some have said, but in the warmest part of the broodnest, next to the thin division-board, the top of the cluster being above the brood-frames. There is a half inch space between the brood-frames and glass.

The entrance to these hives is very small—not to exceed one square inch; and I know by actual trial that the entrance can be closed for weeks at a time, and do no harm to the bees if the weather continues cold and the bees remain in that semi-dormant state which is natural for them in winter, with the temperature of the cluster many degrees lower than when active. In this state I am sure they need very little honey, very little air, and they lose very little vitality. But if roused from this state by any cause they must have air or there will be trouble. With an entrance equal to one square inch kept clear, I have found that they are perfectly safe through the winter.

I have always kept a thermometer on top of the double-glass cover of one of these colonies, and this has never shown a temperature lower than 38 degrees, and this with a temperature outside of 12 below zero. In

ordinary weather it indicates a temperature of 42 to 48 degrees. There are two thicknesses of glass and a dead-air space of half an inch between the cluster and thermometer.

I should like to ask Mr. Doolittle how he reconciles these facts with the statement he has made, that "the heat of a cluster is confined within the cluster or crust of bees," and does not warm the space outside of the cluster.

O. S. REXFORD.

Winsted, Ct.

[Many reports as well as repeated observations year after year convince us that, early in the winter, the cluster of bees will be found up in front of the hive. As the winter advances and the stores are consumed, the cluster works backward. If you repeat your experiences for a year or more yet, we think you will find what we say is true. We agree exactly with you as to the size of the entrance.—ED.]

THE VALUE OF A TWO-INCH SPACE UNDER THE FRAMES.

Twenty-five years ago I worked my bees with an entrance two inches deep, full width of the hive, having special deep rims for all hives having two supers, according to the plan explained by Dr. Miller, p. 290, Mar. 1. After all these years of following the crowd with a half-way compromise that has cost me hundreds of dollars I am going back to the deeper space beneath the frames for strong colonies at all seasons, only contracting the entrance to exclude mice in winter. Dr. Miller should put nothing in to prevent the bees building comb down. For every ounce built below the bottom-bars the bees will store 5 lbs. more surplus in the supers. They will store pollen at the bottom, and go higher up with the honey, owing to their fore-sense of robbery.

While the bees are building any bits of comb beneath they will bring their combs above tight down to the bottom-bars, if only $\frac{1}{2} \times 3 \times 4$ -inch bars are used. They will not build so much burr-comb with a surplus of wax if the extra space is allowed. The extra wax pays for itself if saved, as thousands of colonies in Cuba are run for wax alone, as they pay better to produce wax than an inferior grade of extracted honey. They are not likely to get the swarming fever, as they do with the pent-up space beneath ordinary hives. More air beneath enables them to stay in a second super in the heat of the day, and the deeper cluster gives more uniform heat for the brood and super above it at all times.

F. DANZENBAKER.

Norfolk, Va.

DUCKS IN THE APIARY.

On p. 42, Jan. 1, I see your remarks about ducks in an apiary. You say you never experienced any trouble from them. Just sow a patch of white clover in or near your bee-yard, and then let your ducks in and see how they "do" the bees. I had but one stand left over last winter. The rest were winter-killed. The one that came through

had a queen which you sent me the year before, but it had only a handful of bees in the spring. It increased fast in the spring, and made preparations for swarming. Just then my young ducks took to the clover and after the bees so that all of them died. They ate the bees so fast that they had to run for water.

G. KUNKE.

Panoka, Canada, Jan. 20, 1908.

HONEY PASTE FOR STICKING SMALL LABELS TO TIN.

We have been putting up honey in tin cans and buckets, and have tried all kinds of paste for sticking labels to tin (including flour paste as recommended by Mr. W. H. Laws). We had but poor success until we tried mixing a small quantity of honey with our dextrose and vinegar paste, which ended our trouble in that line.

We have been putting up and selling some six to ten tons of extracted honey per year these last few years. We also tried rubbing the buckets with a rag wet with vinegar, as recommended by N. E. France; but while it helped somewhat, many of the labels would drop off as soon as dry.

These other pastes might do if a label is used that will go clear around the bucket and even lap over a little; but they will not hold a small label.

Mix dextrose and vinegar to the consistency to suit, then add about 2 oz. of honey to the pint of paste. Don't make the mistake of putting too much honey in or the labels will have a greasy appearance and will not dry right. It requires more honey in a dry atmosphere than in a wet one. Such paste will keep in either a warm or cold climate.

Ebensburg, Pa. F. J. STRITTMATTER.

TROUBLE IN MAKING INCREASE.

I have just read an article by Mr. E. W. Alexander, on page 896, on the right way to increase. This matter of increase has been and still is a hard problem for me to solve, I started in to increase 100 colonies, but have lost nearly half the season by their building up so slowly. I had a great many poor and unfertile queens. I am now starting a few nuclei and also the two-queen system with queen-excluders between the hive and cap. I have had a good many years' experience, but have had more trouble with increase this year than ever before. There has been no scarcity of honey at any time, but the queens seem to be slow about laying. My method is exactly the same as Alexander's. Has anybody anything better to offer?

R. E. ZIMMERMANN.

Fresno, Cal., Aug. 3, 1907.

[The trouble in your case, we should say, was poor queens. Better queen, or two ordinary queens to the colony, separated by excluders, would obviate your difficulty to a great extent. As you are trying the two-queen plan we shall be glad to have you report.—ED.]

STIMULATIVE FEEDING DURING THE COLD SPRING WEATHER TO KEEP THE HIVES WARM.

My experiments in feeding in spring were of great value, especially in the cold rainy weather we had last spring. I feed with an inverted beer-bottle through a hole in the hive-cover. Just draw a piece of cotton cloth four inches square over the neck of the bottle and insert it in the hole. This keeps the bees active, and they will keep the entire hive warm, and rear all brood without loss; whereas if they have an abundance of sealed honey in combs they become dormant, or nearly so, and cluster. If the inclement weather continues for two or more days, much sealed brood dies; and the first warm day the hive-front will be covered with hundreds of dead bees with the head formed and legs started, while all unsealed brood is eaten as fast as it is exposed to the outside of the cluster. This may seem incredible, but they invariably do so when cold or starving. The queen, if a good one, will lay eggs at all times when there is honey coming in, but not when the honey is stored in the combs.

When we can keep the queen laying, and all brood reared, the problem of strong colonies is easily solved.

Sonora, Cal.

A. D. HEROLD.

[We question very much whether feeding in early spring serves to keep the colony warm because of the stimulation induced. If the weather is chilly enough to keep a colony back, feeding at such a time would only tend to aggravate matters. Of course, if a colony is running very short, and is liable to starve, then if no combs of sealed stores are available one would be obliged to feed.—ED.]

WATERING BEES IN THE HIVES TO PREVENT THEM FROM FLYING OUT ON CHILLY DAYS FOR WATER.

On page 1498, Dec. 1, Dr. Miller gives us some excellent advice about watering bees. It is my opinion that the most important part of the article is that which relates to the early spring, when the bees are compelled to risk all in order to obtain water for the brood.

I had an Alexander feeder under each hive—some to feed, others to stimulate. There would be times of days in a stretch when the bees would not break cluster to go to the feed at the rear and bottom end of the hive with the prevailing cold winds which swept our prairies.

One fine morning last spring, on going to the tank where the boys were watering their horses, I noticed that the whole surface of the tank was covered with struggling bees drowning in the water. This was not a pleasant sight to behold when fully half of the hives in the apiary were empty and half of the rest were in a weak condition; so I took a pail of water, threw a handful of sugar into it, and gave each colony a pint in the Alexander feeders that were under the hive. In half an hour there were no bees to be seen about the tank. While we may af-

ford to let our bees hustle for their drink during summer time we surely can not afford to do so in early spring. Just slip an Alexander feeder under each hive and give them what they want to drink at home.

Moorland, Ia. J. P. BLUNK.

[Attention has been drawn to this before; but it was stated at that time that the moisture from the breath of the bees, condensed on the inside of the hives in chilly weather, would give the bees all the water they would need for brood-rearing. Whether true or not, we should be glad to hear from any one who may have any fact to offer. We are of the opinion that many bees are lost in the spring in the quest outdoors for water when the weather is bad.—ED.]

QUEENS SUPERSEDED IN WINTER.

I have read in GLEANINGS that bees would not supersede queens in winter. I am sending you two queens just hatched, and there were several more cells in the colony. The same thing happened last winter in my yard in January.

GEORGE GROVER.

Trenton, N. J., Feb. 11.

[While it is true that supersedure usually does not take place in winter, yet if a failing queen leaves eggs or young brood the bees will raise queen-cells as at other times, providing it be not too cold. If it were severe weather there would, of course, be no eggs. In that case the colony, if it survived, would be found queenless in the spring. But if the queen dies the colony is likely to die also.—ED.]

CONCRETE WATERING-TROUGH FOR BEES.

In order to water bees, make a concrete vat 8 feet long, 6 wide, and 6 inches deep; then fill it with sand and small gravel, and it is ready for the water. I have used this three years with good results—no drowned bees as there are around a tank. I keep the sand and gravel drawn up from the center a little so the water can be reached longer. A bucket of water now and then will keep the gravel moist.

B. F. SPAFFORD.

Morning Sun, Iowa.

[This is a good suggestion. If no creek be near, moist gravel should be provided.—ED.]

ENTRANCE-GUARD TO PREVENT ROBBING.

When robbing is going on, contract the entrance of the robbed colony down to one-fourth the usual size, and place an entrance-guard over it. It will be a bold robber that will enter after this is done.

Pittsfield, Ill.

GEO. B. DUFF.

[The scheme of applying an entrance-guard to check robbing we consider excellent.—ED.]

LIQUEFYING HONEY IN AN INCUBATOR.

In regard to an article on page 145, about liquefying honey with hot air, I came to the following idea, which I think would make the job easy, and at the same time do it at very

little cost, and but little attention would be required from the bee-keeper. Just have the machine made with a thermostat, and also supplied with a thermometer, as our modern incubators are arranged, only the egg-chamber (which would be our honey-chamber) should be about twenty inches deep. It would probably be good to have doors on both sides so that the honey-cans might be more easily put in and removed. There should also be double doors, the outside one of wood, while the inside one would be of glass; and the doors should either work side-wise or upward, so as to be more out of the way. The size of the machine will have to depend on the quantity of the honey to be liquefied; but a machine taking eight or twelve 60-lb. cans would be large enough for the average bee-keeper. This machine would probably require a little larger lamp than an incubator of the same dimensions; but if honey will liquefy within 24 hours at a temperature of 100° it surely will consume but very little oil compared with the labor saved; and I think an even temperature of 110 or probably 125° would not spoil the flavor of the honey. I do not think it necessary to have the caps of the honey-cans removed.

New Braunfels, Tex. W. C. CONRADS.

[We have already been experimenting somewhat along these lines. See editorial on this subject elsewhere.—ED.]

PAINTING THE EDGES OF HIVE-BODIES.

In the painting of hive-bodies and supers I wonder how many bee-keepers paint the edges as well as the sides. If you have not tried this, try it and see what a difference it makes when you come to clean them. The unpainted edges well coated with propolis are next to impossible to clean, while with the painted edges it is a very easy matter, as the propolis can not penetrate the wood. It is also important that the edges of hive-bodies resting on the bottom-boards be well painted, as they are nearest the ground, and the unpainted surface would soon turn black and decay. It will pay to paint the floors of the bottom-boards and the under side of the roofs; in fact, the hive should be completely covered with paint excepting only the inside walls. Use nothing but the best grades of pure white lead and oil. Keep the hives well covered with paint, and there is no reason why they should not last a lifetime.

Nisbet, Pa. GRANT STANLEY.

[Our correspondent is entirely right. When we paint, let us make a thorough job. We find it pays.—ED.]

QUEENS SUPERSEDED ON THE DOOLITTLE NON-SWARMING PLAN.

I have had this experience so far with the Doolittle non-swarming plan. If the colonies are not extra strong, or if the queen is poor, the bees will supersede their queens. In fact, they nearly all superseded their queens

for me. The Doolittle plan will work, but I think the swarming should be done just at the commencement of a good flow, and the colonies must be very strong.

Sunnyside, Wash.

S. K. CLOVER.



I came not to send peace but a sword.—MATT. 10:34.

O full of all subtlety and all mischief, thou child of the devil, thou enemy of all righteousness, wilt thou not cease to pervert the ways of the Lord?—ACTS 13:10.

Some time ago I was speaking here in these Home Papers of the wonderful discoveries that were coming so thick, and I said it almost made one stand still and wonder what great thing was coming next. What new and startling gift had God in store for us that should shake and astonish the world? A bright and successful young farmer, a good spiritual man, stopped me in the road a few days after and asked if I did not have faith to believe the next great thing would be somewhere along in the line of spiritual or moral reforms. So far radium, wireless telegraphy, flying-machines, etc., seemed to have little bearing in the way of rebuking sin and crime. I confessed to him I had been feeling a little sad to think these new discoveries had, so far, so little bearing on uplifting the morals of the world that we might almost doubt that they came from the hand of God—moving pictures, for instance. My friend (Adam Lister, Medina, O.), however, declared it as his belief that the next great thing to shake and astonish the world would be along in the line of spiritual things, and possibly something that would reprove and rebuke sinful humanity.

About the same time a good friend from away off on the Pacific coast wrote me something as follows:

Brother Root:—You wonder what great thing is coming next. Well, I am glad to be able to tell you. The Lord Jesus Christ is coming soon to receive his people and to "rebuke the devourer." Shall we not all make haste and be ready to receive him?

Well, this thing has been on my mind ever since the suggestion came from these two friends; but I must confess I was so dull, and had so little faith, I did not recognize that the Lord Jesus Christ had come until I saw in the daily papers that our beloved Ohio had, by an overwhelming majority in both House and Senate, passed the county local-option law. I knew we had been sending some good men to make our laws and to represent the people; but after witnessing defeat after defeat by the rum power in the years that are passed, it was one of my greatest

*I will rebuke the devourer for your sakes, and he shall not destroy the fruits of your ground.—MAL. 3:10.

"happy surprises" when I saw not only *Ohio* but a great lot of the Southern States actually taking the lead. I have given you an account of the fight in the Senate some time ago when I happened to be present. A very bright young attorney from Cincinnati was speaking. He was well educated, handsome, talented, and a magnificent orator; but he was evidently in the employ of the millionaire brewers. He declared he was a temperance man, and in favor of the measure, and was exceedingly anxious to help it along, and I for a time was tempted to think him sincere. The way in which he took defeat after defeat brought forth my admiration; and after it was explained so I could see through his ingenious tricks I could imagine him turning to his employers and saying, "There! didn't I work hard for you? Did I leave any stone unturned to defeat these fanatics?" The "fanatics," however, saw through the "sheep's clothing," and his hypocrisy was rebuked, and buried with a shout. The Christian men and scholars we have been sending to represent us said in action what Paul said to the sorcerer, and just of late the good people all over our land have been saying to all of the great army of brewers and their hirelings: "Thou child of the devil, wilt thou not cease to pervert the right ways of the Lord?"

God has been indeed sending the Holy Spirit, even the spirit of Christ Jesus, down to a sinful world, and, as a result, our churches, Sunday-schools, Endeavor societies, etc., have been working in harmony and furnishing *good men* to be on hand and to be looking after the framing of our laws. The "drawing cards" the liquor party have employed so long, together with their money, seem to be playing out—especially this trick of "amendments," in order to "make our law better" (?). See the following from the *Cleveland Plain Dealer* of Feb. 27:

After three hours of verbal fireworks the House of Representatives this afternoon passed the bill by a vote of 79 to 36. Temperance advocates broke into song at the conclusion of the long fight. The leaders of the movement say the law, which will go into effect Sept. 1, will be the means of wiping saloons out of 75 out of the 88 counties of the State.

Every attempt to defeat or amend the measure was emphatically repudiated. The bill was passed exactly in the form in which it came from the Senate. The big majority persistently refused to consent to a change so much as the dotting of an *i* or the crossing of a *t*.

Representative Foster, of Findlay, attempted to inject an amendment changing palpable errors in construction, grammar, and spelling.

"Is this bill so sacred that this legislature can not be trusted to correct gross errors?" demanded Foster.

The answer was a shout that buried the amendment beyond recall.

The vote against the bill was almost entirely from members representing counties with large cities. The rural members solidly supported the measure as it stood, irrespective of party. It was another demonstration that liquor interests have lost the control they have claimed so long over the Democratic party. The vote for and against the bill was one of geographical location.

The editor of our Medina paper says Medina County will be among the first in the State to be made dry by the new law. The county-seat (Medina) has been dry for over 20 years. Now, shall we not all join in a

friendly strife to see which county and State shall be first to say, in the plain language of Paul, "O child of the devil, thou enemy of all righteousness, wilt thou not cease to pervert the right ways of the Lord?"

When the saloons are cleaned out it will be an easy matter to say pretty much the same thing to the grafters who are stealing the money from our hard-working people in other ways. The love for temperance, purity, and "a square deal" is in the air; and it is because the spirit of Christ Jesus is getting into men's hearts in a way that was never known before.

We have a jail here in Bradenton; and, even if Manatee is a dry county I was surprised to find on my first visit eleven inmates, and most of them (in fact, I may say all) through drink. Two are in for murder, and the murder was done while on a drunken spree just before *Christmas*. The sheriff says the liquor comes from Tampa; but there is strong talk now of making even Tampa, with its 40,000 people, dry.

Last Sunday morning I said to my class in jail, "Boys, I suppose you will all rejoice with me that Ohio has passed the county local-option law, by a big majority."

A big burly colored man at my elbow replied, "Mr. Root, I ain't a very good man, I admit; but I try to be honest and tell the truth. I can't rejoice with you. The most satisfaction I have ever got out of any thing in this world is drink."

I looked him over a little and then replied:

"My friend, if you want the privilege of getting drunk with a clear conscience you certainly would accord the same to everybody else. Suppose we all do your way."

He replied that he could not be responsible for any one but himself.

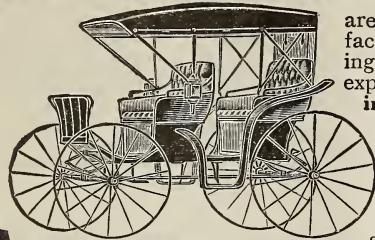
Sometimes we often find something in a private letter that is better than many things written for publication, and I want to close with a sort of postscript from a letter just received from my son, E. R. It gives you a glimpse of him you might not get otherwise.

Dear Father—I have just read your letter in regard to the pledge to the Anti-saloon League. I am placing the same before John. I feel that no money has ever been given to any cause that has been productive of larger results than that which we give to the Anti-saloon League. The showing is getting to be something tremendous; and, just think! it was my old classmate, Howard Russell, who started the movement, and it was you and Mr. Metcalf who held the thing on its feet until it could strike a blow.

The Roots especially ought to feel some pride in having been, as I might say, charter members of this magnificent organization that has helped produce such wonderful results all over the United States. Butler, Indiana, Mabel's old home, has just gone dry, and all the towns near by are now having a battle royal. The thing is going all over the United States, and it looks now as if even you would see the day when the saloons will be banished from all except our large cities and even then they will be crowded off by themselves. The way the great journals are pouring hot shot into the saloon business is very encouraging. Witness what *Collier's* is going to do as per enclosure. It has already published some *splendid* editorials.

May the Lord be praised that it was my privilege, and the privilege of the Root Co., to say, through the Anti-saloon League, "Thou child of the devil," etc., "the hand of the Lord is upon thee."

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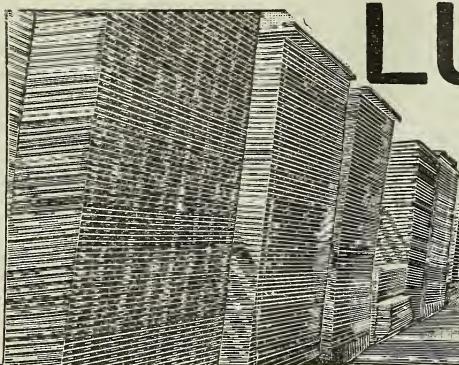
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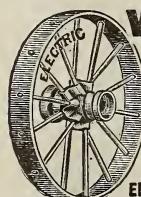


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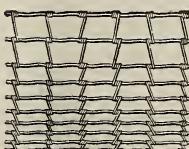
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Fruit and Vegetable Packages and Boxes of all kinds. Write for free money-saving catalog and price list. **L. New Albany Box & Basket Co., New Albany, Ind.** Largest Factory of Its Kind in the Country.



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well-rooted trees. Free catalog. Freight paid. Agents wanted. Special Prices to clear ground.

W. T. Mitchell & Son, Beverly, O.

Large stock; all straight, healthy, healthy.

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5 Hardy Everblooming
5 Roses On their own roots.
ALL WILL BLOOM
THIS SUMMER 25c

Sent to any address post-paid; guaranteed to reach you in good growing condition.

GEM ROSE COLLECTION

White Mama Cochet, pure white.

Mrs. Ben R. Cant, deep red.

Bridesmaid, grandest pink.

Helen Gould, bright red.

Mama Cochet, deep rose.

SPECIAL BARGAINS

5 Carnations the "Divine

Flower," all colors, 25c.

5 Prize-Winning Chrysanthemums, - - 25c.

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10 Superb Pansy Plants, - - - 25c.

15 Pkts. Flower Seeds, all different, 25c.



Any Five Collections for One Dollar, Post-Paid. Guarantee satisfaction. Once a customer, always one. Catalog Free.

MISS ELLA V. BAINES, Box 85 Springfield, Ohio

Wood's Virginia Ensilage Corn.

Superior both in growth and nutritive qualities. Our Ensilage Corn has achieved a big reputation wherever planted.

We are headquarters for all Farm Seeds, Cow Peas, Sorghums, Millets, Crimson Clover, etc. Prices quoted on request.

Write for prices and Wood's Crop Special, giving interesting information about Farm Seeds. Mailed free on request.

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SEEDSMEN, - - RICHMOND, VA.

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69 Varieties. Also Small Fruits, Trees, &c. Best Rooted Stock. Genuine, cheap. 2 sample vines mailed for 10c. Descriptive price-list free. Lewis Roessch, Box A, Fredonia, N.Y.

A beautiful colored plate of our

New Eaton Red Raspberry

and our strawberry catalog of valuable information about varieties with instructions for beginners. Free to all.

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The Best Strawberries
grow from Farmer's plants. Introducer of "Oswego" strawberry and "Plum Farmer" raspberry. Fruit plants, all kinds. Catalog free. L. J. Farmer, Box 808, Pulaski, N.Y.

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Seven splendid new varieties hardy Northern grown apples. Specially adapted to the Northwest. Won the Winder Medal, highest award in U.S. Rapid growers, big yielders, good keepers and shippers. Money makers for fruit growers. Also,

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shade and ornamental trees for group, specimen, or windbreak planting. Especially for locations where only hardy stock will thrive. For 5c for postage and packing, we will send beautiful Hybrid Perpetual Rose and illustrated catalog with full description and prices free. Charles City Nursery & Orchard Co., Box 20, Charles City, Ia.

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After thirty years' experience with this flower we consider our XX mixture the choicest ever offered. Fine blooming bulbs, over an inch in diameter, by mail. 25 cts. per dozen; \$1.50 per 100.

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White Cedar, 3 to 4 ft., 25 cts. each; Spruce, 3 to 4 ft., 25 cts. each; Balsam, 3 to 4 ft., 25 cts. each. Send for price list and get reduced prices on large orders. Address SCHUH BROS., CATAWBA, WIS.

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We offer at reduced prices quite a list of goods located at various points, and chiefly of styles not at present listed in our catalog. You may find here something which you can use to advantage. Orders may be sent direct to Medina, or in some cases direct to the dealer or branch house where the goods are on hand. In ordering, be sure to mention that you saw it in "Bargain Notice" in GLEANINGS.

THE A. I. ROOT CO., Medina, O.

EXTRACTORS.

At Apopka, Orange Co., Fla., one six-frame Cowan extractor for L frame, which has been used in all about 30 days; was sold five years ago, and is the old-style chain reversing type; sold new for \$30.00. We offer this for \$17.00, free on board at shipping-point.

At Medina, O., three eight-frame Root Automatic extractors which have been to Cuba and returned; have been somewhat rusted and corroded by salt air; well cleaned up, and in good condition. With ordinary hand-power gear we will sell at \$32.00 each; regular price \$40.00. With power gear and belt complete, without engine, \$36.00; regular price, \$45.00.

No. 4 Novice extractors at Mechanic Falls, Me.; also at Chicago, Ill.; also Des Moines, Iowa; new stock, but an over supply, offered at \$7.75 each; regular price, \$8.50.

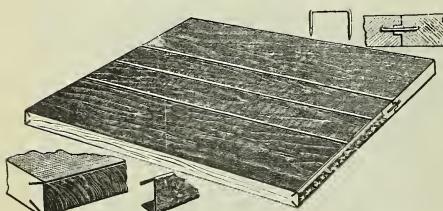
No. 15 Cowan extractor at Mechanic Falls, Me.; new machines in good condition as put out three years ago; offered at \$11.00 each.

DADANT UNCAPPING-CAN at St Louis, Mo., and in New York city; offered at \$7.75 each; new stock in good condition, somewhat shop-worn.

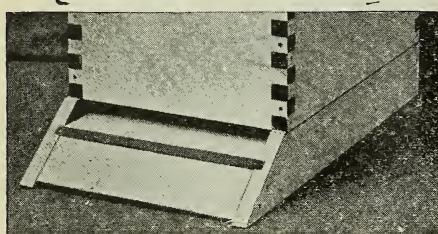
GERMAN WAX-PRESS at St. Louis, Mo., and in New York city; also at Medina, O. These are not of the latest pattern, but good machines in good condition; offered at \$9.00 each; regular price, \$12.00.

BOARDMAN SOLAR WAX-EXTRACTOR at Des Moines, Iowa, and at New York city, in good condition at \$6.00; Regular price, \$7.50. Also at New York a Doolittle solar wax-extractor at \$3.25.

PARTS OF HIVES.



DANZ. NAILLESS COVERS, made of three pieces, tongued and put together with paint in joints and crate-staples over joint at each end, then a galvanized channel steel cleat at each end; the same style as our metal-bound super-cover, only made of $\frac{1}{8}$ -in. lumber. Special price to close out, 20 cts. for 8-frame; 22 cts. 10-frame, which is $\frac{1}{2}$ regular price.
The A. I. Root Co., Syracuse, N.Y., 30 D-8 and 66 D-10
The A. I. Root Co., Philadelphia, Pa., 70 D-8 and 500 D-10
The A. I. Root Co., Medina, O. . . . 200 D-8 and 300 D-10



COMBINED BOTTOM AND HIVE-STAND. This is a very convenient and serviceable hive-bottom which sold at the same price as the hive-cover, or was

included instead of the regular bottom at 5 cts. per hive extra; can be had from the following places in 8 or 10 frame size as listed, at the price of the regular bottom, in lots of 5 or more, 20 cts. each, 8-frame; 22 cts. each, 10 frame.

M. H. Hunt & Son, Redford, Mich., 30 C-8 and 20 10

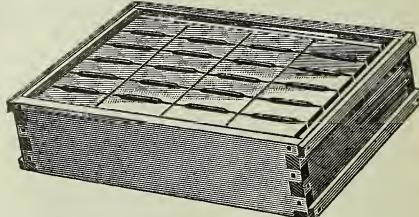
The A. I. Root Co., Syracuse, N.Y., 30 C-8 and 100 C-10

The A. I. Root Co., Philadelphia, Pa., 100 C-8 and 10 C-10

The A. I. Root Co., Chicago, Ill. . . . 80 C-8 and 80 C-10

The A. I. Root Co., Medina, O. . . . 100 C-8 and 100 C-10

John Nebel & Son, High Hill, Mo., 50 C-8



DOVETAILED T SUPER for producing honey in $4\frac{1}{4}$ sections supported on T tins. These are mostly provided with T fences for the $4\frac{1}{4} \times 1\frac{1}{2}$ plain section.

Buck & Wilson, Augusta, Kans., 25 4TP-8; price 50 cts. each for the lot, or 60 cts. each in lots of 5.

The A. I. Root Co., Chicago, Ill., 50 2TP-8.

The A. I. Root Co., Philadelphia, Pa., 25 2TP-8 and 10 Hilton Dov. T supers, which are the same with thumb-screws in one side.

The A. I. Root Co., St. Paul, Minn., 10 2TP-8 and 10 2TS-8 Hilton Dov. T supers.

Price 35 cts. each in lots of 5 or over.

THICK-TOP STAPLE-SPACED FRAMES, L size, with $4\frac{1}{4} \times \frac{1}{4}$ inch end-bars, at \$2.25 per 100, or \$10.00 per box of 500.

The A. I. Root Co., Philadelphia, Pa., 4000 frames.

The A. I. Root Company, Chicago, Ill., 2500 frames.

At both points are also some of the same style, jumbo depth, at 25 cts. per 100 extra.

ALL-WOOD FRAMES, regular style, with The A. I. Root Co., Philadelphia, Pa., 4000; price \$1.80 per 100, or \$7.50 per case of 500.

HOFFMAN FRAMES with square-edge end-bars, otherwise regular; price \$2.50 per 100.
Blank & Hawk Supply Co., St. Louis, Mo., 300 frames.

The A. I. Root Co., Philadelphia, Pa. . . . 1700 frames.

CHAFF DIVISION-BOARDS, regular pattern; price in flat, 10 cts. each; nailed, 20 cts. each, in lots of 10 or more.

Blank & Hawk, St. Louis, Mo., 50 nailed at 20 cts. ea.
The A. I. Root Co., Philadelphia, Pa., 200 . . . at 20 cts. ea.

W. S. Pouder, Indianapolis, Ind., 60 nailed at 20 cts. ea.
M. H. Hunt & Son, Redford, Mich., 75 in flat, 10 cts. ea.

TEN-FRAME DOVETAILED HIVE-BODIES with molded-top Hoffman frames; no division-board; listed as 50.

With The A. I. Root Co., New York city, 300, offered in regular crates of 5 at 60 cts. each, or \$3.00 per crate; lots of 50 or more at 50 cts.

The A. I. Root Co., St. Paul, Minn., have a lot of Danz. hives and supers; also ten-frame Dovetailed hives, nailed and painted, second hand, in good condition, which they will sell at a special price. Correspond direct with them.

STANDARD ROOT SMOKERS. We have here at Medina something less than 100 of these smokers, which have been to Cuba and returned. They are somewhat rusted but may be made serviceable by one not too particular for appearances. Will sell them at 50 cts. each, or \$5.00 per dozen; by mail, 25 cts. each extra.

FREE! 50 lbs. Comb Foundation **FREE!**

WEED'S NEW-PROCESS COMB FOUNDATION.

PRIZES GIVEN AWAY

ABSOLUTELY FREE IN A CONTEST.

FIRST PRIZE—25 lbs. Comb Fdn.

THIRD PRIZE—5 lbs. Comb Fdn.

SECOND “ —10 lbs. Comb Fdn.

FOURTH “ —5 lbs. Comb Fdn.

FIFTH PRIZE—5 lbs. Comb Fdn.

THE ABOVE PRIZES will be given absolutely free to those who will make the largest number of words out of the letters found in the name "Toepperwein." The letters may be used over as many times as desired, but in no single word oftener than found in the name "Toepperwein." Only words found in Webster's dictionary are admitted. The words must all be plainly written in columns, and numbered.

This contest is absolutely free to any one and anywhere. It is a fair contest, and one has the same chance as the other. These contests are very instructive, and just the thing for schoolchildren to pass the evenings. The contest will close May 1, 1908, and all lists with words must then be in, and in May 15th GLEANINGS the results will be published, giving the names of the winners and all the words of the one who wins the first prize. The winners have the privilege of choosing any grade of foundation. We feel confident that the winners will be highly pleased with the prizes, as the comb foundation is as fine and perfect as any machinery can make, and is made right here in our factory out of this clear Southern beeswax.

SHIPPING-CASES.

12-in. 4-row shipping-cases, with 3-in. glass.....	\$17.00 per 100.
9 $\frac{1}{2}$ -in. 4-row shipping-cases, with 3-in. glass.....	15.00 per 100.
10-in. 2-row shipping-cases, with 3-in. glass.....	9.35 per 100.
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7 $\frac{1}{2}$ in. 3 row shipping-cases, with 3-in. glass.....	10.70 per 100.

ROOT'S BEE-SUPPLIES.

We always carry a large and complete stock of The A. I. Root Co.'s make of bee-supplies at Root's factory prices. Write us for illustrated catalog and price list.

WEED NEW-PROCESS FD'N.

We have just received a set of new machinery, and our *Weed New Process Foundation* is perfect and gives perfect satisfaction everywhere.

13,000 CASES OF HONEY-CANS

on the way which will be here in time to supply the bee-keepers with cans. We buy honey in large amounts at market price.

Whenever you are in San Antonio make our office your headquarters and let us show you through our plant. Stay here a while and meet the bee-keepers as they come in. You are always welcome and will be courteously treated.

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Incubator Book; save money on your incubator and be sure of success. Simplest, most automatic incubator made. Runs itself and pays for itself. Takes less oil, 75 per cent hatches guaranteed.

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No machines you can buy for your farm will earn as many dollars as

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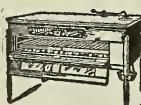
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RELIABLE INCUBATORS

26 years' experience and practical demonstration is crystallized in the one perfect machine. Double heating system, double ventilating, economical—all explained in our interesting poultry book. Write today. Reliable Incubator & Brooder Co., Box B49 Quincy, Ill.



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7 Buys the Best 120-EGG Incubator ever made

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The White and Brown Leghorns are the greatest layers in the World. I keep 1000 of the celebrated Chamberlain laying strain on my Experimental Farm, and to increase the sale of my Perfect Chick Feed, I will send to any one who will send me their name so I can send them my Perfect Chick Feed Catalogue, 2 sittings of Single Comb Brown or White Leghorn Eggs for \$1 for the 2 sittings. Only 2 sittings sold to one person. White or Barred Plymouth Rock Eggs \$1 per sitting. This is a rare chance to get a start of extra fine stock. Send money and have your orders booked early as we can only fill about 1 order in 10 in season.

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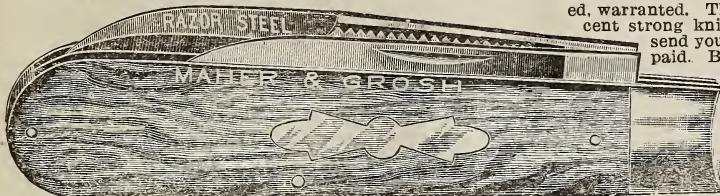
R. R. FISHER, Publisher, Box 50, Freeport, Ill.

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R. C. Rhode Island Reds, White and Silver-laced Wyandotte eggs per 15, \$1.25; Barred Rocks at \$1.25 per 15. Muscovy duck-eggs, \$3.00 per 9. Fine Italian stand of bees, \$5.75 with queen; tested queen, \$1.25.

Address LAFAYETTE POULTRY CO., ALMA, MO.

75c Knife and 60c Shears for \$1.00 postpaid.



Every M. & G. blade is hand-forged from razor steel, file-tested, warranted. This cut is exact size of 75-cent strong knife. To start you we will send you one for 48c; 5 for \$2, postpaid. Best 7-inch shears, 60c. This

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Maher & Grosh Co.,
617 A St. Toledo, Ohio.

"Seaboard Magazine" SIX SOUTHERN STATES SEABOARD'S TRONCHOLD Free

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is, without doubt, seriously affected by the climatic conditions which surround him.

ARE YOU PLEASANTLY LOCATED?

Are you shut by the ice and snow of a rigorous winter, with naught but a cheerless sky to gaze upon? What of your lands now? Covered with snow? How about your stock? Have to be kept housed and fed?

The farmers in our territory are plowing, their stock grazing on the hillsides, and in the famous Manatee section growers are shipping their products to Northern markets, receiving remarkable prices for the same, due to the season.

Our lands are just as fertile as yours, produce just as much and at a time when prices are the best. It's a duty you owe yourself and family to look into this.

CLIMATE IS A MOST IMPORTANT FACTOR in connection with the profits, as well as pleasure, to be derived from your location.

Wouldn't you like to be pleasantly situated, surrounded by climatic conditions which permit work to be carried on the entire year, and where the struggle for existence against the elements of a frozen North is not known?

The climate in the six States traversed by our line is unsurpassed anywhere, and the profits being derived by those who only a few years ago were battling with the rigors of winter in a northern location is evidence of the value of our lands. Do you expect to remain where you are and keep up the struggle? Why not come down into southern sunshine and be pleasantly located, while at the same time you are deriving big profits from your crops?

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Patent practice in Patent Office and Courts.
Patent Counsel of The A. I. Root Co.



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A. G. WOODMAN & CO., Grand Rapids, Mich.

Honey-cases for sale. Two cans to the case. Both cans and cases in A-1 condition. Price 30 cents per case in lots of 100 cases or more. Write for price. **MICHIGAN WHITE-CLOVER HONEY CO.**

The INDUSTRIOUS HEN



The Leading

Poultry Journal

of the South.

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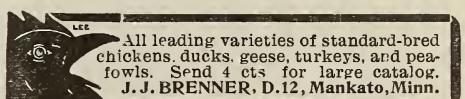
50c One Year; Three Years, \$1.
(Sample Free)

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DON'T WORRY OVER MONEY MATTERS but send for sample copy of Inland Poultry Journal and let us tell you how to make money out of poultry. Two full pages in colors, reproductions from oil paintings that cost us \$1000.00. They are FREE.

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All leading varieties of standard-bred chickens, ducks, geese, turkeys, and peafowls. Send 4 cts for large catalog.
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for 1908 is larger and better than ever. Tells all about pure-bred poultry and illustrates 60 varieties. Contains 10 beautiful chromes of leading breeds—pretty enough to frame. Tells of best Louse Killer, how to cure diseases, make money. Only 10c postpaid. Send to-day for a copy.
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THE NATIONAL NEWS REVIEW.

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Complete NEW STOCK now on hand. Our stock includes a full line of Danzenbaker hives and all other up-to-date goods.

Remember we sell at Root's factory prices, and offer liberal discounts now.

Estimates cheerfully given. Send us a list of your wants, and get our net prices by letter.

Our 1908 catalog is now ready to mail. Write for it to-day. Address

JOS. NYSEWANDER
565-7.W.7th St., Des Moines, Ia.

The Hand System

To satisfy a number of customers we are now making hives to suit the above system, just as the inventor himself uses them. These are not listed in our regular spring catalog, and are not kept in stock at any of our agencies. All orders will be filled from Medina. If ordered early enough, however, they can be forwarded to any one of our branches for redistribution. If you are going to try a few of these hives the coming season, we earnestly urge you to order early before the rush season comes on.

PRICE LIST OF HAND DIVISIONAL HIVE AND PARTS.

We have had numerous calls for divisional hives just as Mr. Hand uses them. We will not list them in our catalog for the coming season, but will make them up to supply on special order, to those who desire to try them, at prices in table below. The outside dimensions being nearly the same as the regular Dovetailed hive, the regular covers and bottoms may be used.

Each section is $19\frac{1}{2}$ in long, $5\frac{1}{2}$ in deep outside; upper portion of side removable with clamps to hold it in place. Sections used are $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{4}$ plain, split three sides. Furnished in both eight and ten frame size.

Hand brood or extracting section, including the frames, springs, clamps, and nails; no foundation
Hand brood or extracting section, including the frames, springs, clamps, and 1-inch foundation starters
Hand brood or extracting section, including the frames, springs, clamps, and full sheets comb foundation
Hand comb-honey section, including section-frames, and fences; no sections or foundation starters
Hand comb-honey section, including section-frames, fences, sections, and full sheets foundation
Hand four-section hive including two brood and two comb-honey sections; no sections or foundation starters
Hand four-section hive including two brood and two comb-honey sections with sections and full sheets foundation
Hand sectional super, no inside fixtures, including clamps and nail tins
Hand brood-frames, $4\frac{1}{4} \times 17\frac{1}{2} \times 1\frac{1}{4}$; ends, $1\frac{3}{4} \times 1\frac{1}{4}$; top, $1\frac{3}{4} \times 1\frac{1}{4}$; bottom, $1\frac{1}{2} \times 1\frac{1}{4}$
Hand section-frames, $4\frac{1}{4} \times 17\frac{1}{2} \times 1\frac{1}{4}$; ends and top, $1\frac{1}{2} \times 1\frac{1}{4}$; bottom, $1\frac{1}{2} \times 1\frac{1}{4}$
Hand fences, $4\frac{1}{4} \times 17\frac{1}{2}$. P style

Designating or Short Name	Nailed and Painted Each	In Flat		
		Each	Five	Weight of 5
Hand 8-8	\$.65	\$.50	\$ 2.25	.35
Hand 8-10	.70	.55	2.50	.40
Hand 9-8	.75	.60	2.50	.35
Hand 9-10	.80	.65	2.75	.40
Hand 0-8	1.30	.85	4.00	.38
Hand 0-10	1.40	.95	4.50	.43
Hand 2-8	.75	.60	2.75	.30
Hand 2-10	.80	.65	3.00	.35
Hand 1-8	1.45	1.00	4.75	.35
Hand 1-10	1.55	1.10	5.25	.40
HandCE8822-8	3.50	2.65	12.00	.180
HandCE8822-10	3.75	2.90	13.25	.190
HandCE0011-8	6.30	4.25	20.00	.200
HandCE0011-10	6.75	4.70	22.25	.210
Hand Super-8	.40	.30	1.25	.22
Hand Super-10	.43	.32	1.35	.24
Hand brood-frames, $4\frac{1}{4} \times 17\frac{1}{2} \times 1\frac{1}{4}$; ends, $1\frac{3}{4} \times 1\frac{1}{4}$; top, $1\frac{3}{4} \times 1\frac{1}{4}$; bottom, $1\frac{1}{2} \times 1\frac{1}{4}$		\$ 2.00 per 100 in flat	\$ 18.00 per 1000	
Hand section-frames, $4\frac{1}{4} \times 17\frac{1}{2} \times 1\frac{1}{4}$; ends and top, $1\frac{1}{2} \times 1\frac{1}{4}$; bottom, $1\frac{1}{2} \times 1\frac{1}{4}$	2.50	"	22.00	
Hand fences, $4\frac{1}{4} \times 17\frac{1}{2}$. P style	1.75	"	16.00	"

The A. I. Root Company, Medina, Ohio

Classified Advertisements.

Notices will be inserted in these classified columns at 25 cents per line. Advertisements intended for this department should not exceed five lines, and you must say you want your advertisement in the classified columns or we will not be responsible for errors.

TO OUR READERS.

If you are in doubt about the value of the classified columns for advertising purposes, please read the following unsolicited testimonial:

I received many answers to my ad. in March 1st issue of GLEANINGS. I have made a choice, and engaged a man who will be here Monday. H. C. AHLERS.
West Bend, Wis.

We have many more just like that. Try the experiment for yourself. You will be pleased with the results.

Wanted, Situations.

WANTED.—By a young man of good habits position in an apiary for the coming season; some experience. Address L. C. KEET, Greenfield, Mass.

WANTED.—By a young man of good habits and considerable experience in bee-keeping a position to work in an apiary for the summer months of 1908.

Address PAUL PUTZKI,
1110 F St., N. W., Washington, D. C.

Experienced, sober, reliable man wants position in sales or shipping department of established house doing a seed, poultry, or bee-supply business.

R. M. LYNCH, 1316 24th St., Galveston, Texas.

Help Wanted.

WANTED.—Apiarist to help with 200 stands of bees, all of which are run for extracted honey. Prefer a young man who has had experience in Cuba or some other tropical country. Will pay \$25.00 and board per month until Oct. 1. Fare from New York, New Orleans, or Havana, first class, \$52.50; second class, \$37.50; from Santiago de Cuba, \$10.00 less.

W. J. YOUNG, Arecibo, P. R.

Post Cards.

Beautiful new Easter post cards—7 for 15 cts.; 13 for 35 cts., postpaid. M. T. WRIGHT, Medina, O.

"Kinks on Post Cards" is a booklet telling you the things you don't know about making photographic post cards. Write for particulars.

E. O. WALTZ, Medina, Ohio.

Plants.

GLADIOLUS BULBS.—Choice stock in mixtures and named varieties. Descriptive price list and cultural directions free. M. T. WRIGHT, Medina, O.

Why not beautify your home by the use of plants? They give the finishing touches, and are very attractive. We have the finest collection of house and garden plants grown by any florist. Write for price list; it's free.

HAMMERSCHMIDT & CLARK,
Dept. A. Florists, Medina, Ohio.

Rugs.

Be sure to send for our circular before you have your old carpet made into rugs. A postal will bring it.

SANITARY RUG CO., Delaware, O.

Poultry Offers.

FOR SALE.—Best White Leghorns; eggs, 15, \$1.00; 30, \$1.75. G. DETTMANN, Appleton, Wis. R. No. 6.

Fine R. I. Red. W. Wyandottes, and Barred Rock eggs, 95c for 14; \$1.90 for 30. C. FAJEN, Alma, Mo.

Business B. P. Rocks. Eggs, 15 for \$1; 35 for \$2; 60 for \$3. MRS. E. J. ADKISSON, Rt. 13, Nashville, Tenn.

FOR SALE.—White Rocks, cocks and cockerels. Write your wants. DR. C. L. VAN OSDOL, Dillsboro, Ind.

FOR SALE.—\$1.00 Barred Rock and Pekin duck eggs. Circular. A. W. NEWCOMER, Glen Rock, Pa.

FOR SALE.—15 Barred P. eggs, \$1.00. They excel as winter layers H. G. LARUE, LaRue, O.

FOR SALE.—Brazilian or Muscovy duck eggs; \$1.00 per doz. C. K. BULLARD, Mechanicsburg, Ohio.

FOR SALE.—White Wyandottes, R. C. B. Minoras, R. C. R. I. Reds, \$1.00 per 15 JAMES STEWART, Franklin Furnace, O. R. F. D.

FOR SALE.—White Wyandottes, 15 eggs, 75 cts.; 30, \$1.25. Uncle Sam potato, very productive; 1 pound by mail, 30 cts. J. F. MICHAEL, Winchester, Ind.

FOR SALE.—Eggs, White Wyandotte, \$1 per 15; \$6 per 100. White Holland turkeys, \$2 per 9. FRANK C. PELLETT, R. D. 4, Atlantic, Iowa.

FOR SALE.—Indian Runner duck eggs from choice stock, \$1.00 per 12; \$4.00 per 55; \$6.50 per 100. KENT JENNINGS, Mt. Gilead, O.

FOR SALE.—Silverlaced and White Wyandottes. Single and Rose Comb R. I. Reds, choice stock, eggs \$2.00 per 30. CHAS. F. L. CLEMONS, Rt. 3, Davenport, Ia.

FOR SALE.—Single-comb Brown Leghorns and Buff Orpington eggs, \$1 per 15; \$4 per 100. Fertility guaranteed. C. M. CONRAD, Flanagan, Ill.

FOR SALE.—B. P. Rock eggs, \$1.00 per setting of 15. Cuthbert red-raspberry plants, 25 cts. per dozen; 120 for \$1.00. H. J. AVERY, Katonah, N. Y.

FOR SALE.—W. P. Rocks, Fishel and Empire strain. I have twenty select females headed by two extra-fine roosters. Eggs, \$2.00 per twenty. W. M. PARRISH, Rt. 8, Lawrence, Kan.

FOR SALE.—Eggs for hatching, S. C. Brown, Buff, and White Leghorns; Buff and White Rocks; Buff Wyandottes and S. S. Hambrugs. \$2.00 per 15; \$3.00 per 30. PETER H. LEVEY, Preston, Minn.

Brown Leghorns, highly bred 35 years, \$2.00 to \$10.00 each. Selected eggs from finest hens, 13 for \$3.00; from average hens, 15 for \$1.00. C. W. LUDLOW, Lookout Mt. Apiary, Rt. 4, Lafayette, Ga.

White Wyandottes, great winter layers; 90 pullets averaged better than 50 per cent yield for December, January, and February. Eggs from these pens, \$1.00 per 15; \$3.00 per 50; \$5.00 per 100. H. H. WOODS, Crown Point, Ind.

Highland Farm S. C. Brown Leghorns are veritable egg-machines, and will lay their weight in eggs in 30 days—farm range, vigorous stock; bred to lay; eggs, \$1.00 per 15; \$1.75 per 30. Prompt service and satisfaction guaranteed. J. E. HAND, Birmingham, Erie Co., Ohio.

For Sale.

A BARGAIN.—10-fr. Dov. hives, one-story, 94c.; two-story, \$1.49. J. F. BUCHMAYER, Dep. G, Iowa City, Ia.

FOR SALE.—Dahlias, 20 kinds, \$1. Catalog. St. Louis Grand Prize. H. F. BURT, Taunton, Mass.

FOR SALE.—Vermont bee-keepers should have my 1908 price list. C. J. LAMB, East Calais, Vt.

FOR SALE.—200 lbs. brood or surplus foundation at a bargain. F. W. LESSER, Sta. A, Syracuse, N. Y.

FOR SALE.—A full line of bee-keepers' supplies; also Italian bees and honey a specialty. Write for catalog and particulars. W. P. SMITH, Penn, Miss.

FOR SALE.—A set of tinsmith's tools and machines in good repair, cheap. E. D. HOWELL, New Hampton, N. Y.

FOR SALE.—New empty 10 L. frame redwood hive-bodies, 30 cts. each. H. VOGELER, Box 104, Rt. 1, Fruitvale, Cal.

Flower seeds, 20 packets, 10 cts.; no two alike. As-ters, pansies, carnations, etc. Dahlia roots, 7 c. each; 25 for 75 c. W. F. TALG, Union Center, Wis.

Beautiful long-haired Persian and Angora cats and kittens; solid whites and various colors; none better. Send stamp for written reply.

KENSINGTON CATTERY, Marion, Ohio.

FOR SALE.—Honey-cans, used but once, emptied without steam or water, bright and clean; 100 cases or more, per case two cans, 25c; 50 cases, 30c; 25 cases, 32c; less, 35c. E. R. PAHL & CO., Milwaukee, Wis.

FOR SALE.—If you want an illustrated and descriptive catalog of bee-keepers' supplies for 1907 send your name and address to FRANK S. STEPHENS, (Root's Goods.) Paden City, W. Va.

FOR SALE.—About 1300 or 1400 cases, two five-gallon cans each, practically free from nail-holes, and were new tins when originally shipped to us. Make us an offer. CLEVELAND HEALTH FOOD CO., Cleveland, O.

FOR SALE.—Alexander wire bee-veils, no pins or sewing required; made from the very best wire cloth at 60 cts. each, postpaid. FRANK ALEXANDER, Delanson, N. Y.

FOR SALE.—Two hundred 8-frame dovetailed hives (Root's make), 200 5-gal. honey-cans in cases (new) at Lovelock, Nevada. Address C. K. ERGANBRACK, Watsonville, Cal.

FOR SALE.—Best Wisconsin sections, per 1000, \$4.00; 2000, \$7.75; 3000, \$11.10; No. 2, 50 cts. less. Discount on Root's and Danz, hives and other supplies. Fifteen eggs, B. P. Rocks and Wyandotte, \$1.00; Pekin ducks, 11 eggs, \$1.50. H. S. DUBY, St. Anne, Ill.

FOR SALE.—One good part bloodhound dog; will hunt all kinds of game; well broke, \$15; Rose Comb Brown Leghorn eggs, full blood; fifteen eggs, 75 cents; per 100, \$3.50. Italian queens, 60 cts., untested. GEO. J. FRIESS, Hudson, Mich.

FOR SALE.—Well-established queen-rearing business, widely advertised for two years; large circle of steady customers; best testimonials; orders at hand; best location and climate; no speculation. Reason for selling, departure for Europe. Write immediately to A. E. TITOFF, Iomosa, Cal.

FOR SALE.—Eight Danzenbaker hives, complete with ten supers; frames filled with comb; 300 No. 1 sections; a few pounds of comb foundation; smoker, bee-escapes, etc. All used only one season. Good as new. Price \$15.00 for complete outfit. Original cost, over \$30.00. H. M. WINKEL, 533 Lincoln Ave., Milwaukee, Wis.

FOR SALE.—75 eight-frame Root hives with good worker combs; used two seasons; also lid and bottom; \$1.60 each. One hundred 4 $\frac{1}{4}$ supers, trimmed with sections and foundation; used one season; \$10.00 each. Sixty 10-frame hives and 5 Danzenbaker hives, with combs wired, all Root's goods, \$1.75 each, without super. Thirty 8-frame supers, trimmed, \$3.00 each. H. A. ROSS, Evansville, Ind.

FOR SALE.—My out-apriary of 25 colonies very cheap, or I will sell the bees for \$4.00 per colony. They are in The A. I. Root Jumbo hive, all good straight combs, built on wire. It is in a good place in an orchard, one block from the street-car; honey-house and fixtures. J. M. ROOD, 2234 Jefferson Ave., W., Detroit, Mich.

Real Estate for Bee-keepers.

FOR SALE.—Three village lots with a three-room house, small barn and henhouse, and 100 colonies of bees in two-story dovetailed comb-honey hives, tractor and all fixtures; good location; satisfactory reasons for selling. Write for particulars if interested. S. LAMONT, Jarrett, Minn.

FOR SALE.—A desirable farm of 118 A. in southern Michigan, well located, and in a fine bee country; 100 A. plow land in a good state of cultivation; 15 A. valuable timber, plenty of good buildings, good water, and a fine bee-cellars. Write for particulars.

FLOYD E. SMITH, Somerset Center, Mich.

Bees and Queens.

FOR SALE.—75 colonies of bees in eight-frame L. hives. GUSTAVE GROSS, Lake Mills, Wis.

WANTED.—25 hives of bees; must be free from disease. HENRY ROORDA, Fair Oaks, Ind.

FOR SALE.—Bees and honey; good opportunity for right party. Address C. H. CLUTE, Lexington, Ky.

Early queens, 70 cts.; after May 15, 60 cts.; also queen-supplies. List free. A. RAITRAY, Almont, Mich.

FOR SALE.—100 colonies bees on L. frames, at \$4.00 each, on summer stand; also 12-in. fdn. mill cheap. R. J. SMITH, Street Road, N. Y.

Italian queens, untested, 75 cts.; tested, \$1.00; 2-fr. nucleus, with queen, \$2; 8-fr. colony with queen, \$7 and \$8. E. M. COLLYER, 75 Broadway, Ossining, N. Y.

FOR SALE.—Twelve colonies Italian bees in shipping-boxes, on 7 L or H. frames, in good condition, at \$3.50 per colony. W. M. AMELANG, Ottumwa, Ia.

FOR SALE.—Fifty colonies of Italian bees, 8-frame Dovetailed hives, straight combs, no disease; \$6.00 per hive. P. H. DAVIS, Camden Place, Minneapolis, Minn.

FOR SALE.—Ten stands of Italian bees in Langstroth Simplicity hives. Will exchange for anything I can use. Bees are strong and in good condition. Make an offer. D. R. PHILLIPS, Brownsville, Pa.

FOR SALE.—400 colonies Italian bees in 8 or 10 frame Dovetailed hives with Hoffman frames, at \$6.00 per colony. In lots of 10, \$5.00 per colony. F. A. GRAY, Redwood Falls, Minn.

MOORE'S strain, and golden Italian queens, untested, \$1.00; 6, \$5.00; 12, \$9.00. Carniolan, Banat, and Caucasian queens, select, \$1.25; 6, \$6.00; 12, \$10.00. Tested, any kind, \$1.50; 6, \$8.00. Choice breeders, \$3.50. Circular free. W. H. RAILS, Orange, Cal.

FOR SALE.—After May 15th, Italian, Carniolan, and Caucasian queens. Tested, \$1.00; dozen, \$11.00; untested, 75 cts.; dozen, \$8.50; virgins, 40 cts.; dozen, \$4.50. Nuclei, after June 10 1 2, and 3 frame, \$2.00, \$3.00, \$4.00, including queens. Orders booked now. Cash orders filled first. EDW. A. REDDOUT, Baldwinsville, N. Y.

Wants and Exchange.

WANTED.—To buy one cock and two or more pea fowls. Will buy in dozen lots if price is right.
CHAS. MCCLAVE, New London, Ohio.

WANTED.—Large hand or power spraying-outfit.
G. A. WATT, Bellevue, Ohio.

WANTED.—About 500 colonies of bees on shares, or will buy; have handled large apiaries successfully.
F. B. CAVANAGH, Flint, Mich.

WANTED.—Refuse from the wax-extractor, or slum-gum. State quantity and price.
OREL L. HERSHISER,
301 Huntington Ave., Buffalo, N. Y.

WANTED.—To exchange strawberry, blackberry, and raspberry and rhubarb plants of the leading varieties for honey-extractor, fdn., or any thing I can use in apiary. JOHN D. ANTRIM, Rt. 1, box 55, Burlington, N.J.

Honey and Wax For Sale.

Fancy orange-blossom, 60-lb. cans, 8½ cts.; water-white sage, 8½ cts.; light amber, 8½ cts.; dark amber, 8 cts.
E. R. PAHL & CO., Milwaukee, Wis.

FOR SALE.—302 lbs. of No. 1 white-clover comb honey in 4½ plain sections, no-drip cases; 17 cts. a pound.
E. D. TOWNSEND, Remus, Mecosta Co., Mich.

FOR SALE.—5000 lbs. clover and amber honey in 160-lb. kegs.
C. J. BALDRIDGE, Homestead Farm,
Kendallia, N. Y.

FOR SALE.—A few 60-lb. tins of Michigan's best raspberry extracted honey.
A. G. WOODMAN CO., Grand Rapids, Mich.

FOR SALE.—Fancy white comb honey; also extracted basswood, white clover, alfalfa, and amber honey in barrels or 60-lb. cans.
ROBT. A. HOLEKAMP & SON,
4263 Virginia Avenue, St. Louis, Mo.

FOR SALE.—White comb honey, No. 1, average 23 lbs. to the case of 24 sections, \$3.25 per case; amber, \$2.50. Fancy white extracted in 60-lb. cans, 10½ cts.; amber, 9½ cts.
HAROLD HORNER, Jenkintown, Pa.

FOR SALE.—Choice extracted honey for table use—thick, well-ripened, delicious flavor; color, light amber; remained on hives for months after being sealed over. Price 8 cts. per lb. in 60-lb. cans, two to case. Sample 10 cts.
J. P. MOORE, queen-breeders, Morgan, Ky.

FOR SALE.—Fine article buckwheat comb, 22 to 23 pounds net per case, \$2.75; balance of our amber at \$2.50 per case; six cases candied comb at \$2.00 per case. All cases have 24 sections.
QUIRIN-THE-QUEEN-BREEDER, Bellevue, Ohio.

Honey and Wax Wanted.

WANTED.—White ripe extracted honey; will pay cash.
GEO. RAUCH, No. 5343 Hudson Boulevard,
North Bergen, N. J.

WANTED.—Comb, extracted honey, and beeswax. State price, kind, and quantity.
R. A. BURNETT, 199 S. Water St., Chicago, Ill.

Bee-keepers' Directory.

My late circular on bees and poultry will interest you.
H. G. LARUE, LaRue, O.

ITALIAN queens bred for honey, untested, 75¢ each
GEO. H. PLACE, 816 No. 49th St., Omaha, Neb.

Bee-keepers' Supply Co., Lincoln, Neb. We buy car lots of Root's goods. Save freight. Write.

ITALIAN QUEENS from imported mothers; red-clover strain, \$1.
A. W. YATES, 3 Chapman St., Hartford, Ct.

ITALIAN QUEENS.—Mott's long-tongued (Imp'd) and goldens. Circular free.
E. E. MOTT, Glenwood, Mich.

ITALIANS, CARNIOLANS. No disease. Two-comb nucleus with queen, \$3.00.
A. L. AMOS, Comstock, Neb.

Golden-all-over and red-clover Italian queens; circular ready.
W. A. SHUFF, 4426 Osage Ave., Phila., Pa.

I club a high-grade Italian queen with GLEANINGS, new or renewal.
W. T. CRAWFORD, Hineston, La.

ITALIAN BEES, queens, honey, and Root's bee-keepers' supplies.
ALISO APIARY, El Toro, Cal.

Well-bred bees and queens. Hives and supplies.
J. H. M. COOK, 70 Cortlandt St., New York City.

For bee-smoker and honey-knife circular send card to
T. F. BINGHAM, Farwell, Mich.

GOLDEN yellow Italian queens—my specialty. Price list free.
E. E. LAWRENCE, Doniphan, Mo.

BEE SUPPLIES.—Send list of wants for low prices and best goods to
E. T. ABBOTT, St. Joseph, Mo.

ROOT'S BEE SUPPLIES. Send for catalog.
D. COOLEY, Kendall, Mich.

SWARTHMORE Golden-all-over, Caucasian, Banat, Carniolan, Cyprian queens. E. L. PRATT, Swarthmore, Pa. Queen rearing outfits and books: new 40-p. catalog free

Root's bee-supplies at factory prices, *Black Diamond Brand Honey*, and *bee-literature*. Catalog and circulars free.
GEO. S. GRAFFAM & BRO., Bangor, Maine.

Have you seen Hand's queen circular? It's an eye-opener. Your address on a postal card will bring it. It will pay you to send for it.
J. E. HAND, Birmingham, Erie Co., O.

QUEENS.—Improved red-clover Italians, bred for business, June 1 to Nov. 15, untested queens, 60 cts.; select, 75 cts.; tested, \$1.00 each. Safe arrival and satisfaction guaranteed.
H. C. CLEMONS, Boyd Ky.

ANGEL is breeding his Golden beauties and bright three-banded Italian queens, but will not offer any for sale this season, on account of not being at home at all times of the season.
SAMUEL M. ANGEL, Evansville, Ind.

Improved Italian queens now ready. Nuclei and colonies May 1 to 10th. Over twenty years a breeder; 500 colonies to draw on. Free circular and testimonials. For prices see large advertisement in this issue.
QUIRIN-THE-QUEEN-BREEDER, Bellevue, O.

ITALIAN BEES AND QUEENS. I breed three-banded stock only, and use the finest breeding stock to be had. For prices, see display advertising columns in this issue. Send for price list. Twenty-five years' experience.
F. J. WARDELL, Uhrichsville, O.

TENNESSEE QUEENS.—Best that experience can produce. Untested three-band and goldens, \$1.00 each; 6 for \$5.00; 12 for \$9.00. Caucasians and Carniolans, \$1.25 each. Write for circular, order goldens from Ben G. Davis; others from John M. Davis, Spring Hill, Tenn.



HOME AGAIN.

Will the friends who want to write A. I. Root personally, bear in mind that he expects to be in Medina once more, shortly after April 1?

HONEY WANTED.

We are in the market for comb honey in Danzenbaker sections, either clover or basswood. Only fancy or A No. 1 grades are required. If you have any on hand which meets these requirements, please communicate at once, stating quantity and price.

MAPLE SUGAR AND SYRUP.

The maple-groves in this vicinity have produced an abundant crop of choice sweets this season; and while we have not yet secured very much of it, we expect to be well supplied as soon as the roads improve and producers have time to bring it to market. Fancy first-run syrup brings \$1.15 per gallon; six gallons or over, \$1.10, while good ordinary syrup can be had at \$1.00 per gallon; six gallons or over, 95 cts.; twenty-five gallons and upward at 90 cts. Maple sugar is worth 12 to 15 cts. per lb., according to quality and quantity. We should be pleased to hear from those interested, stating quantity you can use, when we will quote you.

A BARGAIN IN DANZ. SUPERS AND SHIPPING-CASES.

We offer at a special bargain 120 Danzenbaker ten-frame supers, nailed and painted, filled with section-holders, Hyde-Scholl "M" fences, sections with full sheets of foundation. They have been used, but are nearly new and in good condition. Such supers new are listed in our catalog at \$1.75 each, yet we offer this lot crated and on board cars at Floresville, Texas, at 50 cts. each for the lot, and will throw in 1000 4x5 sections to make good any in the lot which may be broken or missing. In lots of not less than ten the price would be 60 cts. each; 50 at 55 cts. each as they are crated and loaded on cars. There are also 400 shipping-cases to hold 20 4x5 sections in the crates as shipped from the factory, which we would sell at \$5.00 per crate of 50, or \$9.00 per 100 for the lot—that is, \$140 cash for goods worth new at carload prices over \$340. This surely is a bargain for any one desiring to produce fancy comb honey with equipment that can not be excelled for the purpose. They are not in the right locality for comb-honey production, but should work excellently in some other locality. Send your orders here to Medina.

CLOVER SEED OF ALL KINDS SCARCE

Judging from the very high prices prevailing for clover seeds, the supply must be scarce. Mammoth medium and alsike are selling at \$13.00 and upward per bushel. White clover is not so high. This can be furnished at \$10.00 per bushel. Alfalfa is also high, and brings \$12.00 per bushel, while there is no change in crimson.

We have had an unusual demand for sweet-clover seed, and have but very little of it left. We shall be in the market for several tons of seed from this season's crop; and when the time comes to gather it we should be pleased to correspond with those who can supply the seed of both white and yellow, hulled or unhulled. If any of our readers have any seed on hand to dispose of we should be pleased to hear from them, naming quantity and price. We still have some yellow hulled seed which we offer, while it lasts at 25 cts. per lb.; 10 lbs., \$2.30; 25 lbs., \$5.50; 100 lbs., \$21.00. We have some white seed, nearly all hulled, but containing a small per cent of unhulled seed. Price 3 cts. per lb. less than the above. We can also supply a limited quantity of unhulled seed at 17 cts. per lb.; 10 lbs., \$1.50; 25 lbs. or over, at 14 cts.; by mail, 10 cts. per lb. extra for any of the above to pay for postage and packing.

THE ALEXANDER BEE-VEIL.

We have secured, for making a bee-veil of wire cloth, a special weave of cloth having 8 meshes to the inch, and No 32 wire painted black. Ordinary window-screen cloth is of the same size of wire, and 12 to 14 meshes to the inch. This special cloth is, therefore, more transparent, and obstructs the vision less, than any other cloth we were ever able to secure. One objection to a veil of this kind is its bulk and the difficulty of transporting it, either by mail or when packed with other goods. We have overcome this one objection by

making it with an open seam from the crown to the bottom of the skirt. Eight small safety-pins are included to pin up this seam when you receive it, or you may prefer to sew it up. The veil is rolled up so as to be placed in a box 3 x 3 x 12 inches so that it can be mailed safely for 12 cents postage, or packed with other goods to go by freight. Price, complete, 60 cts. By mail, 72 cts. Special wire cloth for veil furnished at 6 cts. per foot or piece for a veil at 18 cts.; by mail, 3 cts. a foot extra, or 25 cts. postpaid for a veil-piece 10 x 33 inches, having edges folded ready to sew on the cloth parts.

SIMPLEX HONEY-JARS.



The factory have assured us that we may again secure this popular honey-jar in several sizes, including the one holding one pound of honey. We have ordered a fresh supply, and expect to have them in stock this next month. They will be packed in reshipping-cases of two dozen each, and the price will be \$1.10 per case; 6 cases, \$6.30.

NO. 25 HONEY-JARS.

During the past year we have had an unusual amount of trouble with breakage of this jar, even in the reshipping-cases packed with corrugated paper. The breakage occurred either in the porcelain cap or the top rim of the jar where the cap rests. We find we can get this same jar with lacquered tin cap without the center being cut out. This cap is lined with waxed paper wad, which seals tight on the top edge of the jar. This style of cap not only does away with breakage almost entirely, but enables us to furnish the jar at a lower price. We are not yet supplied with the new stock, but expect to have them this month at the following price. They will be packed as usual, two dozen in reshipping partitioned cases. No. 25 jars, tin cap lined, 90 cts. per case; 6 cases, \$5.10. We can still furnish from stock the usual style of No. 25 with porcelain caps at \$1.10 per case; 6 cases, \$6.30.

A NEW SIZE OF SECTION.

There seems to be a demand in some localities, where bees are inclined to daub with propolis or otherwise discolor the wood in sections for a wide frame completely enclosing the sections. Our regular supers are adapted to the regular sections in section-holders without a top-bar. To provide a top-bar as well as a bottom it is necessary either to make the super deeper or the section shorter. In order to use the regular deep super we have decided to make a new section, 4 1/4 x 4 1/4 x 1 1/2 or 1 1/2 plain, no beeway. This will be used in a section frame hanging by top-bar in the regular deep super, interchangeable with the shallow Hoffman frame 5 1/2 deep. This will necessitate a new fence adapted to this size of section, which will be designated by the letter N. The 4 1/4 x 4 1/4 x 1 1/2 will hold a full pound, and will work best in the eight-frame super, 24 to the super. In the Danz. width (164) ten-frame super the 4 1/4 x 4 1/4 x 1 1/2 will fit best 32 to the super. These sections may be split for inserting foundation by the Hand method, and the correct size of sheet for that purpose would be 4 1/4 x 17 1/2. Price of N section-frames, \$2.50 per 100 in flat. Price of N fences, \$2.00 per 100. Sections 4 1/4 x 4 1/4 x 1 1/2, same price as regular Danz., \$4.75 per 1000. No. 1; \$4.25 for No. 2. Unless you specify we will send frames and sections 1 1/2 wide, and supers fitted with the same. Deep super fitted with N section-frames,

N fences and springs, either 8 or 10 frame, will be designated 2 1/8". Price, nailed and painted, 70 cts. each; in flat, 55 cts.; 5 for \$2.50.

2 N 10. Price, nailed and painted, 75 cts. each; in flat, 60 cts.; 5 for \$2.75.

With sections and foundation-starters included.

4 N 8. Price, each, nailed and painted, \$1.00; in flat, 75 cts. each; 5 for \$3.50.

4 N 10. Price, each, nailed and painted, \$1.05; in flat, 80 cts. each; 5 for \$3.75.

With sections and full sheets of foundation.

1 N 8. Price, each, nailed and painted, \$1.40; in flat, \$1.00 each; 5 for \$4.50.

1 N 10. Price each, nailed and painted, \$1.45; in flat, \$1.05 each; 5 for \$4.75.

These are not listed in our catalog this season, and not in stock with any of our dealers. If you wish to test them you will have to make special orders to secure them. You can get them through your dealer if you order in ample time and are not in a hurry to receive them. This section will require a new size of carton and a new size of shipping-case to put them up for market. We offer the new size for experiment this season to see if it has sufficient warrant for introduction into the catalog another year. By cutting beeways in the top and bottom they could be stored without fences or separators, and four could be placed in a shallow Hoffman frame for storing, though they would not be as well protected as in a section-frame. The latest style of shallow frame with 3/8-inch ends would be rather scant in length inside to take four sections, but those made earlier would have room.

Convention Notices.

The Central Tennessee Bee-keepers' Association will meet in the rooms of the Nashville Board of Trade on Saturday, April 25, at 10 A.M. A full attendance of the members is desired, as this is the regular annual meeting for the election of officers, etc. A good program has been arranged, which will include essays and discussions on subjects of interest to bee-keepers.

J. M. BUCHANAN, Sec.

Franklin, Tenn.

The seventeenth annual convention of the Connecticut Bee-keepers' Association will be held in Jewell Hall, Y. M. C. A. building, Hartford, at 10:30 A.M. Apr. 9, for the election of officers and the transaction of any other business proper to come before the meeting. A program of unusual interest and value is being arranged and no bee-keepers should fail to attend. The matter of organizing a fall fair, under the provisions of a State law, is to be considered, which will be of vital interest to the honey industry.

J. A. SMITH, Sec.

The Northern Michigan Bee-keepers' Association will meet in convention at Manistona, April 8 and 9. There will be three sessions on Wednesday, the 8th, and two on Thursday. The headquarters will be at the Handy Hotel, and the place of meeting, Medaile Hall. Ladies are cordially invited, especially for the last day, when a picnic dinner will be held at the hotel.

PRIZES.

Best case comb honey.—1. One Danzenbaker hive, nailed and painted. A. I. Root Co. 2. American Bee Journal one year.

Best 10 lbs. extracted honey.—1. One Aspinwall hive. 2. One Bingham smoker.

Best 5 lbs. beeswax. 1. One Woodman hive. 2 Bee-keepers' Review one year.

Best new invention for bee-keepers and honey-dealers. 1. 500 sections. Lengst & Koenig. 2. A B C of Bee Culture. E. M. Hunt. E. E. COVEYOU, Sec.

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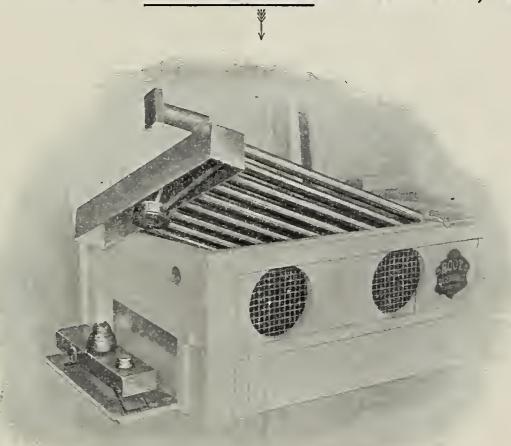
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It's the only one that gets away from that old-fashioned hot-air hover.

It's the only one that supplies the warmth to the chicks as the old hen does it.

The chicks come in contact with these warm tubes and breathe cool, fresh air at same time.

Read
"Our Homes"
by



A. I. Root,
March 1st
issue.

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Mr. A. J. Bartlett, of Vineland, N. J., reports, "Our results with the Root Brooders are very flattering; for instance, in our last two hatches (Feb. 15, 1908) we raised 100 per cent of chicks hatched."

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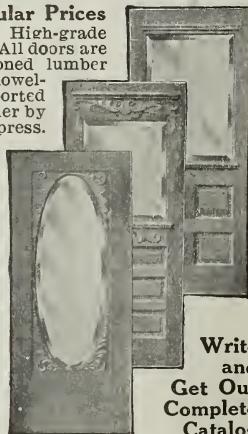
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